

fibers and filaments

the experts' magazine

issue 25 – september 2016



Dressing the world

A comparison between China and India

China and India are the two biggest players in the global textile market. For both countries, the textile industry is a key sector.



ITMA Asia + CITME and ITME 2016

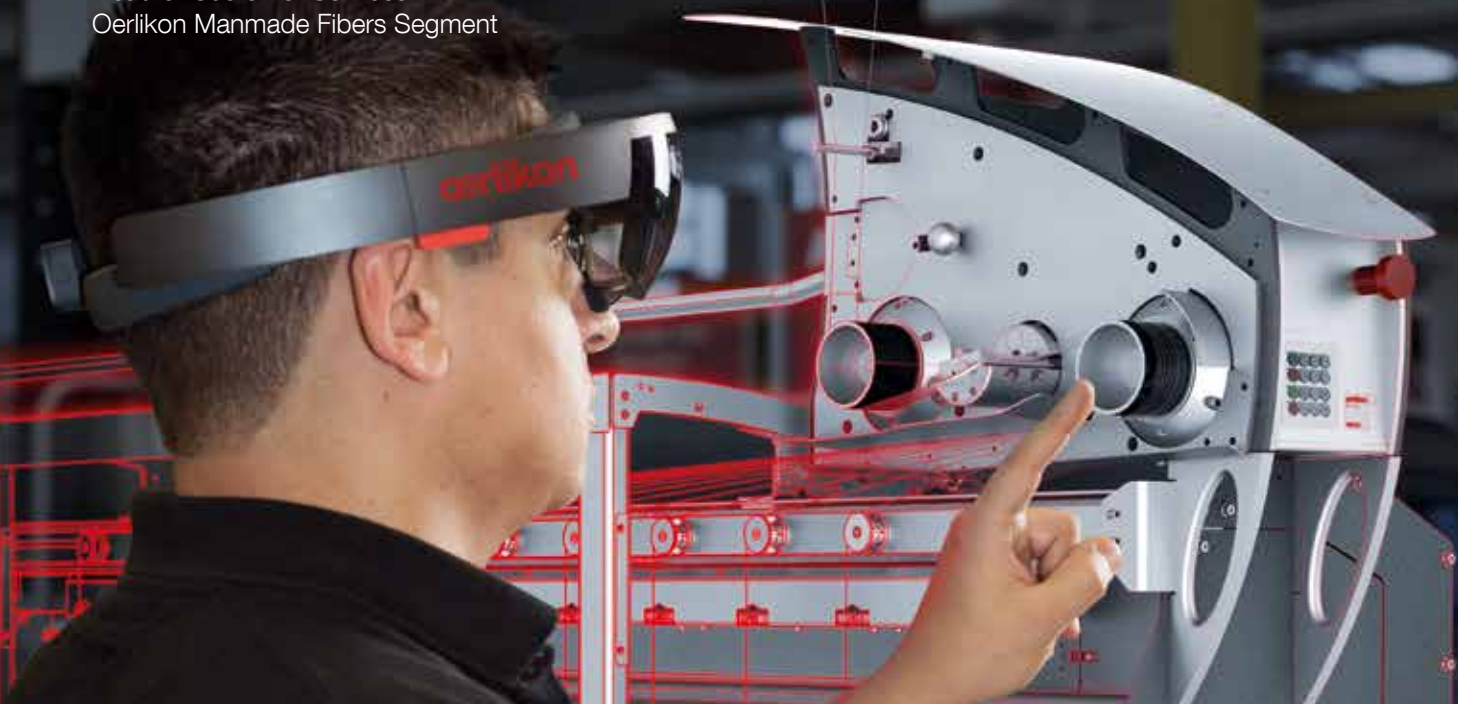
The Future is Now

Numerous new products and solutions at the ITMA Asia + CITME and ITME 2016



"In combination with Microsoft HoloLens we are entering a new world of Customer Services solutions with highest benefit for our customers."

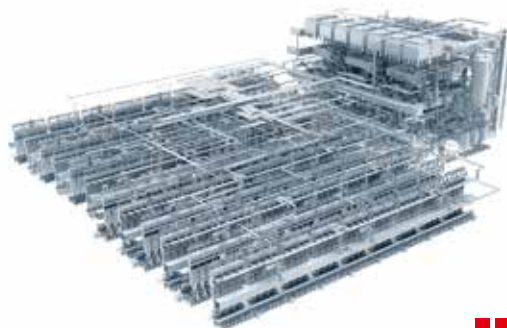
Marcel Bornheim
Head of Customer Services
Oerlikon Manmade Fibers Segment



The Future is Now

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

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



oerlikon
barmag

oerlikon
neumag



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



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

In focus



Dressing the world – a comparison between China and India

For both countries, the textiles industry is a key sector, contributing a substantial share towards overall export volumes.

8

Innovation and technology



Efficient, flexible, economical

Depending on the specific application, the demands on filters are extremely high.

14

People



Generation change in development management

The head of Research & Development Dr.-Ing. Klaus Schäfer will be retiring on January 1, 2017.

18

In brief

News and reviews 4

On the markets

ITMA Asia + CITME and ITME 2016 20
Standard Carpets modernizes on a grand scale 26
Airbag yarns on the rise 28
Oerlikon Barmag at the K 2016..... 29
VDMA symposium 2016 30
Noticeable staple fibers boom in India 31

Imprint 32

Editorial



Dear Customers, dear Readers,

In line with the trade fair calendar for this autumn, we are thrilled to be presenting you with an edition of *Fibers & Filaments* with a focus on China and India. Asia's two most-populous countries are both considered heavyweights of the textiles world. Nevertheless, there are huge differences between the textiles industries of the respective countries.

China is countering the downturn of the last few years with a new 5-year plan. Here, there is a continuation of the rise of quality yarns; priority is being given to the promotion of sustainable and innovative technologies, with the country – as the world's largest manmade fiber producer – increasingly focusing on particularly efficient production processes.

The picture is different in India, where the production of natural fibers still dominates. Although the country is deemed to be the second-largest manmade fiber manufacturer after China, its global market share is 19 times smaller than that of China.

This autumn, we will be unveiling our technology and services innovations to an international trade audience in both countries. We will be presenting you with new yarn, fiber and nonwovens manufacturing solutions at the ITMA Asia in Shanghai between October 21 and 25 and at the ITME in Mumbai between December 3 and 8.

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

With best regards,

Georg Stausberg
CEO Oerlikon Manmade Fibers Segment

2016: strong DTY year

For its texturing machines business division, Oerlikon Barmag is reporting strong sales figures and a considerable rise in orders received for the ongoing fiscal year. In the current year, the market leader in filament manufacturing systems is supplying the majority of type eFK and eAFK machines to China, but also to Southeast Asia, South America and the Middle East.

The reasons for the disproportionately high demand for texturing machines are diverse: in addition to numerous replacement investments and system modernizations, Chinese POY manufacturers in particular are increasingly integrating texturing into their production operations. With this, they are counteracting falling margins caused by the general decline in raw material prices and the resulting price pressure on POY.

Outside of China, the trend towards greater automation continues unabated: 25% of the DTY machines delivered were type eAFK. (bey)



Have been very successful in 2016: Oerlikon Barmag texturing machines.

Service Sales under new management

Since August of this year, Dr. Wolfgang Ernst has been heading up the Service Sales division of all sites within the Man-made Fibers segment. The team around the 44-year-old is part of the Sales division; this guarantees optimum liaison for the entire lifecycles of the investments of systems customers. Service Sales products include upgrades, modernizations and services such as consulting, remote maintenance and workshop concepts.

Dr. Wolfgang Ernst comes to us from the Barmag Brückner Engineering joint venture, where he was responsible for extrusion and spinning technology for many years, with the machine construction engineer most recently running the sales division there. (bey)





Specialties still in demand despite the weak market in China

Despite the continuing market slow-down in China, the new Manmade Fibers segment joint venture Oerlikon Barmag Huitong Engineering recently signed an order for a 60,000 tons-per-year polycondensation system. The system, which will already be commissioned in the Jiangsu Province in the second half of 2017, will be installed upstream to an existing filament spinning system to convert it into a direct spinning system.

What is so special about the new system: it caters to the high demand for differentiated fibers. To this end, yarns with bright, cationic dyeable, semi- and full-dull features can be produced, as can special polyester

with flame-retardant, low-melting-point, high-shrinkage, water-soluble and anti-static properties. Such polyesters can also be deployed in the manufacturing of films, bottles and industrial yarns. Furthermore, the system is sufficiently flexible to process polyethylene terephthalate (PET) and polytrimethylene terephthalic (PTT).

Oerlikon Barmag Huitong Engineering Co. Ltd. has comprehensive experience in polycondensation systems concepts for differentiated polyester fibers. In this regard, the company was the world's first supplier to develop and manufacturer the corresponding technology ten years ago. (zhm)



Oerlikon Barmag Huitong Engineering supplies the engineering and construction of polycondensation plants for textile as well as bottle grade chips.

Events

FloorTek

October 18-20, 2016, Dalton, USA
<http://floor-tek.com>

Saltex Symposium

October 5-6, 2016, Dornbirn, Austria
<http://saltex.messedornbirn.at>

ITMA Asia + CITME

October 21-25, 2016, Shanghai, P.R. China
www.itmaasia.com

“K” 2016

October 19-26, 2016, Düsseldorf, Germany
www.k-online.de

Hofer Vliesstofftage

November 9-10, 2016, Hof, Germany
www.hofer-vliesstofftage.de

Filtration

November 8-9, 2016, Philadelphia, USA
www.inda.org

International Textile Conference Aachen Dresden Denkendorf

November 24-25, 2016, Dresden, Germany
www.aachen-dresden-denkendorf.de

International Conference on Technical Textiles & Nonwovens

November, 10-12, 2016, New Delhi, India
www.textileconferenceiitd.com

India ITME 2016

December 3-8, 2016, Mumbai, India
<http://itme2016.india-itme.com>

Heimtextil 2017

January 10-13, 2017, Frankfurt, Germany
<http://heimtextil.messefrankfurt.com>

Domotex 2017

January 14-17, 2017, Hanover, Germany
www.domotex.de

Denkendorfer Innovationstag

February 15, 2017, Denkendorf, Germany
www.itv-denkendorf.de

Index

April 4-7, 2017, Geneva, Switzerland
www.index17.org

New service station takes shape

In keeping with Oerlikon's commitment to the Indian market, the Manmade Fibers segment is investing in a green-field service station at Vadodara to strengthen our service set-up in the region.

The construction work of the new service station is in full swing, and basic civil work is now complete. We hope to inaugurate the new service station in the New Year. With this, we will be expanding our existing repair and spare parts storage facilities to complement our business in the region. The new service station will help to improve existing operations as well as deliveries and enables us to better serve our customers with new technologies in the coming years. (mks)

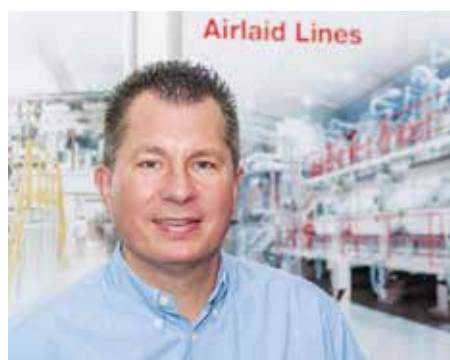


Vadodara is home to one of the largest service stations of the Manmade Fibers segment. The inauguration of the new service set-up is planned for 2017.



New contact partner for airlaid systems customers

Following the departure of Peter Schnell, Stefan Kessler has taken over the liaison for Oerlikon Neumag airlaid systems customers worldwide. The 47-year-old industrial engineer has been looking after European spunbond and meltblown systems customers since 2014. (che)





Dastranj Reza Baft expands texturing operations

The Iranian manmade fiber company Dastranj Reza Baft is planning to supply the local microfiber yarn market using ten new texturing machines from Oerlikon Barmag. With this development, the yarn manufacturer will be the proud owner of the first eFK and eAFK texturing machines in Iran.

The first eFK texturing machine was successfully commissioned in the first quarter of 2016. The Iranian trendsetter will deploy the system, with its 240 positions, to manufacture 75f144 microfiber yarns with elastane. "With the eFK, I can demonstrably achieve superior yarn quality and set a new benchmark within the Iranian market", comments Managing Director Dr. Hamid Dastranj, clearly happy with his investment and consequently placing further orders: at the end of the year, two additional eFK machines for microfiber yarns with elastane and – as the



country's very first automatic texturing machine – a multispindle-design eAFK will be commencing operation. Six further texturing machines are planned for the coming year, allowing the entrepreneur to considerably expand his production capacities.

Dastranj Reza Baft is considered something of a trendsetter within the Iranian textiles market. The company manufactures pre-oriented yarns (POY), which are textured and circular-knitted at the company's own facilities. The target market is the apparel sector, particularly quality and specialty yarns.

The yarn producer is hoping to use the loosening of the economic sanctions against Iran to diversify its product range and is planning to set up FDY production facilities and to establish its own polycondensation system for manufacturing polyester for both direct spinning and bottle grade in the future. (bey)

Relies on Oerlikon Barmag technology:
Hassan Dastranj, Owner of Dastranj Reza Baft (middle), with Oerlikon Barmag's Jilali Lakraa (left) and Khosrow Rahimi, Oerlikon Barmag Sales Representative in Iran.



Dressing the world – a comparison between

China and India are the two biggest players in the global textiles market, with China far ahead of its rival. For both countries, the textiles industry is a key sector, contributing a substantial share towards overall export volumes.

Textiles is a price-sensitive sector and, over the last decades, India and China have benefitted from low wages and a high availability of workers. With rising wages and countries such as Thailand or Bangladesh up-and-coming, the two countries have to adapt their business concepts away from and towards automated production and higher quality.

Textiles as a core industry

China's textiles industry is an important livelihood industry and an industry that creates new international competitive advantages, that integrates technology with fashion and simultaneously promotes clothing consumption and the consumption of industrial textiles and that plays an important role in beautifying people's lives, supporting the development of related industries, boosting domestic demand, constructing ecological civilization, enhancing cultural confidence and promoting social harmony. In 2015, prime business revenue of China's textiles industry

"The global trend shows a significant shift from cotton to manmade fibers. In India, we need to shed the bias in favor of cotton and allow for this market development. Our country has strong potential for a competitive manmade fibers industry."



Kurshed Thanawalla
Member of the Board Oerlikon
Textile India Co. Ltd.

reached about 7 trillion renminbi, accounting for 6.4 percent of prime business revenues within all industries. Textiles and apparel exports reached 291.148 billion US dollars and accounted for roughly 13 percent of China's goods export.

India's textiles and clothing industry is also one of the mainstays of the country's economy. The sector has an overwhelming presence in the economic life of the country. Apart from providing one of the basic necessities of life, the textiles industry also plays a pivotal role through its contribution to industrial output, employment generation and the export earnings of the country. It contributed about 14 percent towards the industrial production, 4 percent towards the gross domestic product (GDP) and 13 percent towards the country's export earnings in 2013. The textiles sector is the second largest provider of employment after agriculture.

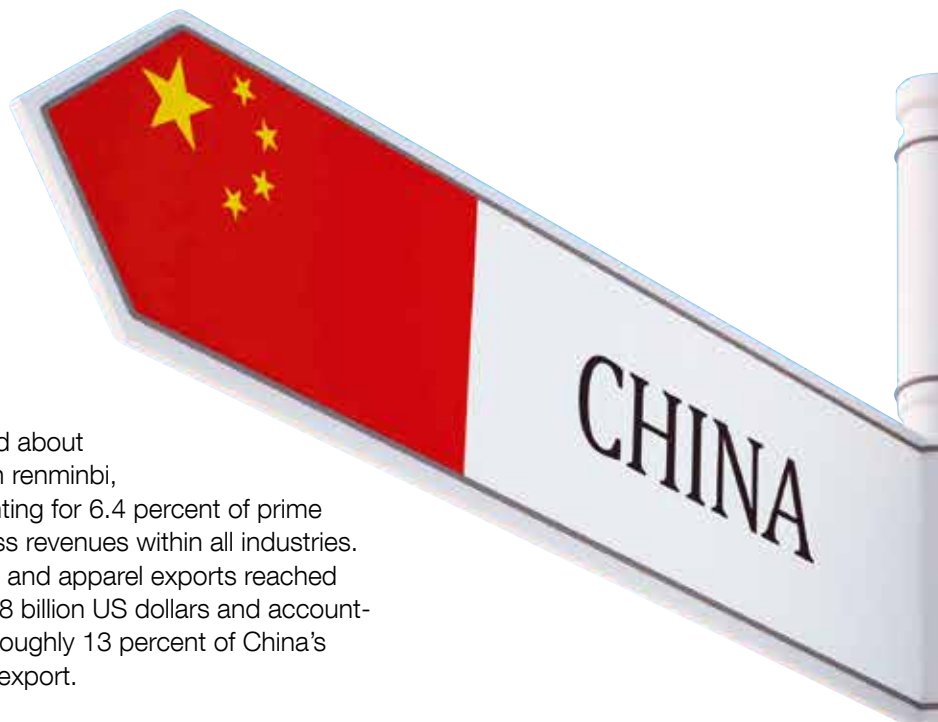
India: the world leader in cotton output

In terms of mill fiber consumption, the disparity between China and India is striking, with China occupying an overwhelmingly dominant position.

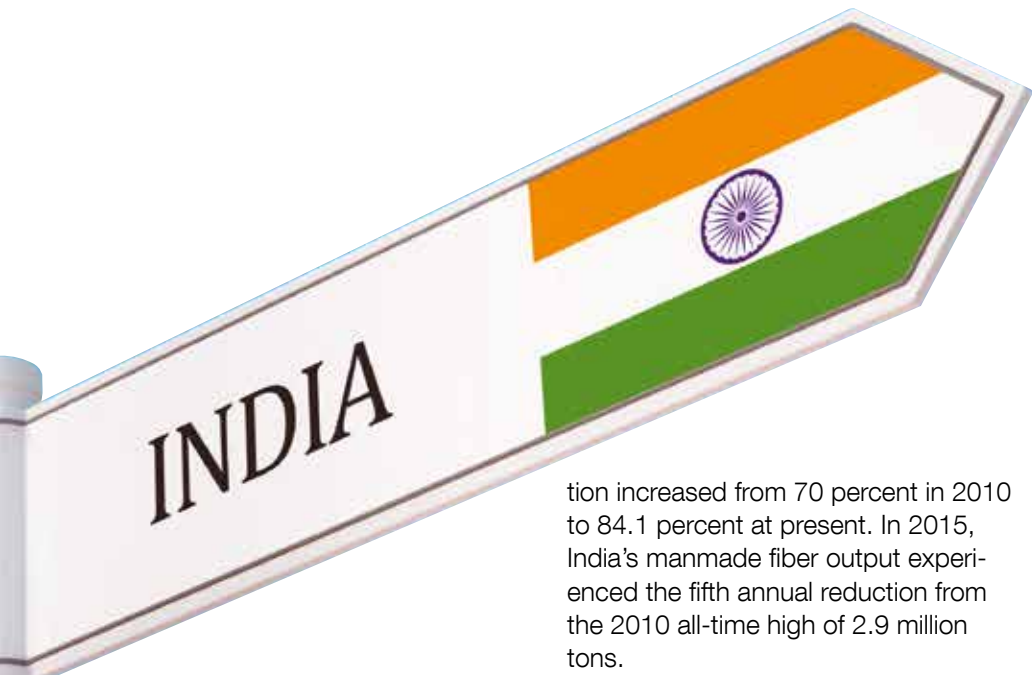
China's textiles mill fiber consumption – with average annual growth of about 5 percent – reached 53 million tons in 2015 and accounted for roughly 55 percent in total global fiber processing, ranking first in the world. India's textiles mill fiber consumption on the other hand is on the decline. In 2015, it fell by about 6 percent to 11.2 million tons. It was the second annual reduction since the 2013 all-time high of 12.2 million tons, and the share in the total global fiber processing declined to about 12 percent.

Cotton output is concentrated on a small number of nations. The eight leading growing countries produce around 86 percent of world supply, accounting for 19 million tons.

While the Chinese industry had to cope with a sharp fall in cotton output, India became the largest cotton producer



China and India



in the 2015/16 season and will further extend its leadership. At the moment, India's world market share is about 27 percent and still growing. This development results from a historical policy of boosting the production of natural fibers. In China, the decline in cotton production results, among other things, from farmers switching to cultivating food crops instead of cotton. This is why cotton cultivation has shrunk over the past few years.

China dominates the manmade fiber market

In terms of manmade fiber production, the situation is the reversed: China holds a dominant position in the world, while India's share in the global market decreases year-on-year.

The story of the Chinese manmade fiber industry is characterized by breathtaking success: coming from a 25-percent global market share at the beginning of the century, it has grown to 70 percent today. China's manmade fiber output is about 19 times that of India. In 2015, about 48 million tons of manmade fibers were produced, corresponding to an average annual growth rate of 13.3 percent, while the share of manmade fibers in mill fiber consump-

tion increased from 70 percent in 2010 to 84.1 percent at present. In 2015, India's manmade fiber output experienced the fifth annual reduction from the 2010 all-time high of 2.9 million tons.

Domestic consumption on the increase

With a growing middle class and better per-capita income in general, clothing is a growth market in both India and China. Hence, the clothing industry has become the main driver for the development of the textiles industry. Both Chinese and Indian people spend about 7.5 percent of their income on clothes. In absolute numbers, Indians spend about half of the amount Chinese people spend due to their lower per-capita income. Data from the World Bank show that in 2014 total household consumption expenditure per capita was 725 US dollars in India and 1,420 US dollars in China.

Large investments and huge potential

Since 2009, the growing pace of investment in China's manmade fiber industry has noticeably slowed, but the number of newly-launched products is picking up. In 2015, the investment presented a downward trend, indicating that enterprises' urge to invest has cooled. Since 2003, foreign direct investment (FDI) has been fluctuating cyclically. In 2014, inflow of FDI reached 0.17 billion dollars and about 0.6 percent in total, while China's FDI

Industrial textiles hold huge potential for both countries, reflected in the investments made in this sector. The industry is growing fast, with a clear concentration on nonwovens.

"Currently, China's textile industry is facing several problems in terms of interim excess capacity, increasing pressure of international competition, structure adjustment and industrial upgrading. The focus of the 13th 5-year-plan is on innovation, increasing efficiency and green manufacturing to solve these problems and strengthen industrial competitiveness."



Wang Jun
President of
Oerlikon China Co. Ltd.

increased to 2.83 billion dollars with an average annual growth of roughly 25 percent for the third consecutive year. Generally, the scale of India's FDI is smaller than China's.

US – the greatest importer of Chinese and Indian textiles

Between 2000 and 2014, Chinese textiles and clothing exports remained unchallenged at the top, while India's ranking jumped from ninth to third. The gap between Chinese and Indian exports is widening, increasing from 4.5 times to 8.3 times. However, India sees expansion potential because of rising wages in China and poor working conditions in Bangladesh.

The US, the EU, Japan and the ASEAN countries are the major export markets for Chinese textiles and apparel, accounting for about 55 percent. In 2015, China's textiles exports to the EU and

Japan declined sharply – on the one hand, due to the weaker yen and euro and, on the other hand, due to China's cotton policy.

India's main customers are the US, the United Arab Emirates and China, with the US taking the biggest share of about 31 percent of all textiles exports. Negotiating a free trade agreement with the EU, India hopes to increase its market share in Europe.

The future: industrial textiles

Industrial textiles hold huge potential for both countries, reflected in the investments made in this sector. The industry is growing fast, with a clear concentration on nonwovens.

The demand for industrial textiles products follows the development and industrialization of a country. Given the large scale of the industrialization

in emerging nations, the market for industrial textiles can only be expected to grow in tandem with industrial growth in different parts of the world. In India, the industrial textiles sector has registered an annual growth rate of 11 percent during the 11th Five Year Plan and, for the 12th Five Year Plan, estimates by the sub-group on industrial textiles predict that the market for industrial textiles will grow even further. The lion's share of 90 percent goes to the domestic market.

In China, the industry is growing rapidly, with economic performance consistently improved and application fields further extended. In 2015, the mill fiber consumption of the industrial textiles industry stood at about 13.5 million tons, up 9 percent year-on-year and accounting for 25.5 percent of the total mill fiber consumption.

“The innovative Oerlikon Barmag and Oerlikon Neumag technologies help our customers to improve their quality and to create added value for their products. With our solutions and services, we support manmade fibers producers in defining competitive products for future markets and – as a consequence – in growing sustainably.”



Wang Jun
President of
Oerlikon China Co. Ltd.



However, growth depends on the sector: while fabrics for infrastructure construction, environmental protection and lifestyle and health maintained fast growth, other sectors saw slower growth or even falls – for leather substrates, textiles for transportation vehicles and cord fabrics, for instance.

Free trade, energy and labor costs – the global impact

The textiles industry is highly dependent on global framework conditions, such as global economic growth, energy costs and wages, trade rules and commodity prices – especially oil prices.

These changes to global framework conditions are generating substantial uncertainty, providing both opportunities and the challenges for the development of textiles industry. At the moment, low oil prices are a huge benefit for all importing countries, which India and China are. Low oil prices not only lower production costs for which energy consumption plays a role, they also have a major effect on the purchase costs as crude oil is an important raw material for polyester, nylon acrylic and the likes.

India has signed various free trade agreements with both regions (including ASEAN, SAFTA and Mercosur) and countries. Further agreements are currently being negotiated, among them an FTA with the EU.

China is also loosening the rules on FTAs and has signed agreements with ASEAN, Hong Kong, Iceland and Switzerland, among others. An FTA with the EU is being negotiated.

Labor costs are still a factor in apparel manufacturing, but their role in the overall supply chain has become less important. Due to the influence of technology, capital costs, raw material prices etc., the disparity of the overall costs between the various players is narrowing.

Many studies predict that India and China will gain a significant share of the world textiles and yarns trade, and become two engines for global textiles industry.



“Being the only supplier of total solutions from melt to yarn, fibers and nonwovens, Oerlikon’s Manmade Fibers segment has the know-how and the capabilities to accompany the establishment of a diverse manmade fibers industry in India. Our experts are consultants, process engineers, machine constructors and service engineers – we value the partnership with our customers throughout the lifecycle of their investments”



Kurshed Thanawalla
Member of the Board Oerlikon
Textile India Co. Ltd.

Developed countries such as the US, Germany and Italy are still way ahead in the textiles industry. Leveraging their fundamental strengths in innovation, talent, and strong industrial ecosystem clusters, these nations are competing with renewed strength and surpassing their low-cost rivals. Half of the top 10 exporters are developed countries in Europe and America. Italy has outperformed some traditional textiles exporters such as India. Driven by a focus on innovation and advanced technology, the shift to higher-value advanced manufacturing is shaping a new battleground for the global textiles industry.

Flattened costs have brought profound changes in the global textiles supply chain. The distribution of the manufacturing industry will become increasingly regionalized, and more consumer goods will be produced locally. By adopting production innovations that improve speed and efficiency, such as new bonding and gluing technologies, textiles and apparel producers can more readily locate their manufacturing centers closer to

customers and increase their responsiveness to fashion cycles. By working together with suppliers to adopt a standard unit of measure, they can help bring cost transparency to the supply chain, providing their production partners with an incentive to improve productivity. And by improving coordination with tier-one, tier-two, and tier-three suppliers, they can more actively manage their raw-material needs.



Environmental regulations are becoming increasingly stringent. Environmental regulations implemented at both a country and international level have a huge impact on product development and business decisions made by the companies operating in the textiles and apparel industry.

The nature of regulation evolves over time. Key events, new additions and regulatory deadlines will continue to be introduced. Any business that misses the relevant deadlines might be subject to penalties. This could have more of an impact on companies than expected if supply chains are not managed tightly and breaches emerge from sub-contractors.

REACH, BPR and Chinese environmental regulations



are having a big impact on the textiles industry. As the nature of these regulations continues to evolve, companies need to carefully monitor any key deadlines.

Airbnb of textiles? The sharing economy

A completely new field of business is the sharing economy which is likely to reshape the global textiles industry and change production modes and business patterns. According to Crowd Companies, global investment in the sharing economy totaled nearly 4.21 billion dollars in 2015. The rapid expansion can be seen in a number of enterprises, including DIDI, Uber and Airbnb – names nobody had heard of until a few years ago. The textiles industry has only just begun to develop with regards to the sharing economy and is expected to have a bright future.

¿Que será? – future development

India and China are two of the fastest growing economies in the world. Their textiles industries, in particular,

exert immense influence on the global textiles industry. China's low-cost labor advantages and its status as the largest exporter of goods in the world have kept it among the most competitive producing nations. However, its future competitiveness is expected to have different attributes. Rising costs, an evolving middle class, and greater focus on technology and innovation will change China's global manufacturing trajectory. On the other hand, India continues to offer some of the lowest labor costs in the world, while boasting an abundance of engineers along with an English-speaking workforce to aid in the growth of services and the overall manufacturing industry. Many studies predict that India and China will gain a significant share of the world textiles and yarns trade, and become two engines for global textiles industry. (jli, mks, sbu)



Efficient, flexible, economical

Meltblown technology for filtration applications

Almost 500,000 tons of nonwovens are currently used annually in the production of filters, which corresponds to approx. 10% of current worldwide industrial nonwovens manufactured. Here, the filter market is split into two areas: air and liquid filtration. While in excess of 170,000 tons of nonwovens were manufactured for gas/air filters in 2015, the volume for liquid filters was almost double at around 295,000 tons.



The trend in filtration applications is increasingly focusing on ever more efficient filter media - a trend for which the Oerlikon Neumag meltblown technology is particularly suitable.

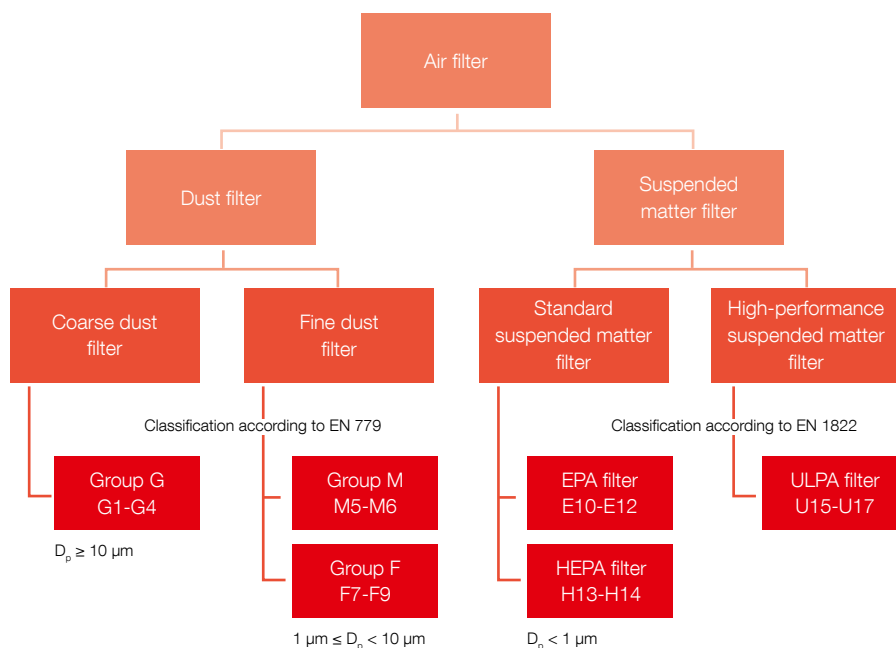
Depending on the specific application, the demands on filters are extremely high. To this end, high-efficiency particulate air filters for clean rooms must, for example, filter $< 1\mu\text{m}$ particles from the air with virtually 100-percent efficiency. Filters must achieve their separation performance with the lowest possible pressure drop – in other words, filter resistance. Pressure drop is one of the most important quality features of filters: the lower the pressure drop, the more energy efficient the filter of the corresponding filter class is. A good example here is vacuum cleaner filters. The class in the case of vacuum cleaners depends on the energy consumption. This is also influenced by the vacuum cleaner filter. If the filter is too dense, the vacuum cleaner draws more electricity and the energy consumption increases.

Comparison of two technologies

Highly-efficient filters can either be manufactured from synthetic fibers or glass fibers. Today, filters in the HEPA and ULPA filter classes – the classes with high filter separation performances – in particular are still produced using glass fibers. Here, synthetic filters offer benefits: glass fiber filters achieve their separation performance only by means of the fineness of the pores. That is why the pressure drop is relatively high. In contrast, filters manufactured from synthetic fibers can be electrostatically charged. For this reason, their pores can be comparatively larger, which in turn considerably reduces the pressure drop. Furthermore, glass fiber filters harbor the risk that glass fiber particles can be released, which end up in the clean air, result in contamination and could be breathed in.

Efficient filters made from meltblown nonwoven materials

Meltblown technology is one of the most efficient methods for producing very fine and highly-separating



filter media made from synthetic fibers. Depending on the application, the pore size of a meltblown nonwoven material ranges from 5 to 40 μm . Here, smaller pores increase the mechanical filtration performance, albeit at the expense of higher pressure losses. The fineness of the meltblown fibers used for filter media lies in the 200 to 2,500 nm range. However, even fibers with nanoscale fineness are often not sufficient to filter the finest particles from air or liquid flows. For this reason, the nonwovens are treated online or offline; for example, they are electrostatically charged to increase their filter performance.

Electro-charging for superior filter separation performance

The filter efficiency can be considerably increased by means of so-called electro-charging – where the nonwovens are electrostatically charged. There are two options for charging nonwovens for industrial applications: triboelectric charging or corona charging. Today, corona charging is the method predominantly used.

Oerlikon Neumag, one of the leading manufacturers of meltblown systems, is currently developing its own concept for electrostatic charging of meltblown nonwoven materials. This distinguishes itself from concepts currently available on the market due to its high flexibility with regards to charging the most varied nonwovens. Users can freely choose from a large number of variation possibilities and set the optimum charging method depending on the filter application. Initial laboratory trials have shown that the Oerlikon Neumag charging unit can also be used to manufacture EPA- and HEPA-class filters. For example, a H14-class filter with an efficiency of 99.995% at a pressure drop of less than 100 Pa has been produced.

Meltblown process for numerous polymers

The polymers used for manufacture are just as diverse as the applications for the filters. The spectrum ranges from PET, PLA, PBT polyesters, PA and polyolefins (PP, PE) all the way through to special polymers such as PPS and TPU. All these and further raw materials can be spun using the Oerlikon Neumag meltblown process. This process is characterized by its constant melt pressure distribution and simultaneously consistent dwell time across the entire width of the spinning beam, which in turn ensures particularly homogeneous nonwoven properties and basis weights. Furthermore, the innovative guidance and distribution of the process air outside the coat-hanger



In case nanoscale fineness of fibers is no longer sufficient, non-wovens are electrostatically charged.

distributor offered by the Oerlikon Neumag technology prevents so-called hotspots. As a result, even extremely sensitive raw materials can be reliably processed into high-quality nonwoven media.

In-house R&D Center for innovative development

As a high-tech company with a clear commitment to research and development, Oerlikon Neumag is dedicated to continual innovation: at the comprehensively-equipped meltblown R&D Center, the processes and the machine technology – along with the manufacture of application-optimized nonwovens – are continually tested and further developed. The pilot line has a spinning width of 550 mm and comes



with additional equipment. A comprehensive range of testing devices and tools is available for analyzing nonwovens. By contacting the Oerlikon Neumag sales department, customers can also utilize the laboratory for their own product development and optimization.



Summary

The trend in filtration applications is very clearly increasingly focusing on ever more efficient filter media with minimum pressure drop. The Oerlikon Neumag meltblown technology is particularly suitable for this. This is also underlined by the orders placed with the Neumünster-based systems manufacturer by leading meltblown nonwoven material manufacturers over the past few months.

The overwhelming share of the filter media still used today is produced from multi-layer nonwoven laminates. Here, manufacturers generally have to resort to nonwovens that are available on the market. By using the Oerlikon Neumag meltblown technology, these filter media can be directly manufactured in a single-step process, whereby the producer then has complete control over the raw materials deployed and lower manufacturing costs as well as being able to reliably and consistently fulfill the high quality requirements of its customers.

(che, lat)

“We are trendsetters because we listen to our customers”

An era is coming to an end. After more than 30 years at the Remscheid-based machine and systems constructor, Chief Technology Officer Dr.-Ing. Klaus Schäfer will be retiring on January 1, 2017. He will be succeeded by Jochen Adler, currently the development project manager responsible for all new developments in the Manmade Fibers segment.

Fibers & filaments spoke to Dr. Klaus Schäfer and Jochen Adler about technology leaps and edges, innovations and future trends.

» **Dr. Schäfer**, you have been decisively in charge of Oerlikon Barmag technology, and recently also responsible for Neumag, for over 30 years now. Under your leadership, there have been numerous developments that continue to characterize the textiles industry to this very day. Looking back, what has been your personal highlight?

Naming just one Oerlikon Barmag highlight after so many years is very difficult. If I analyze my time at the company, there are basically two things that fill me with pride: we have over the years established ourselves at the technology and market leader in filament yarn spinning. And we achieved that with our strength of innovation. We have brought various processes and technologies in closer contact with each other. To this end, not only have texturing and spinning mutually benefited each other, so too have the Oerlikon Neumag and Oerlikon Barmag technologies. For example, we have with the Evo-

Quench set new standards in terms of yarn properties, quality and energy consumption. We have questioned established processes and completely changed established procedures and ways of thinking with our WINGS concept. In addition to the right idea, this requires above all courage.

And the second thing I am truly proud of is that I am leaving the Manmade Fibers segment in the certainty that the team continuing here has the necessary strength and the creativity to be innovative. The team I am handing over to my successor makes a deci-

sive contribution to the success of our company. And I am totally convinced that I have found the right successor in Jochen Adler, who will continue along this path paved with success with this fantastic team of experienced developers.

» **Dr. Schäfer**, when you hand over the reins to your successor in January, what advice will you be giving him? Or let us ask your successor himself: **Mr. Adler**, what is the legacy you are being left with after collaborating with Dr. Schäfer for the last ten years?

Dr. Klaus Schäfer: Not to lose the connection to our customers. As Chief Technology Officer, you are responsible for the technology that leaves our works. This requires continual dialog with our customers. Jochen Adler maintains very close, partnership-like contact with our customers. And he must absolutely continue to do so.

Jochen Adler: Well, I of course have some very big shoes to fill. Dr. Schäfer has created a very strong market position for the Manmade Fibers segment and particularly for Oerlikon Barmag. This is a precious treasure that we must nurture and protect; for me personally, it is a great challenge.

I have now been working alongside Dr. Schäfer for more than 10 years – this has very much shaped me. The close relationship to our customers helps me identify areas of activity. Although my tasks will change from January onwards, I want to continue having an open ear for all our customers. This is what ultimately drives us: we develop solutions that provide our clientèle with real value added. And this is a promise that we have to fulfill!

» **Mr. Adler**, what will completely change after January? What topics are particularly close to your heart?

I believe in continuity with the simultaneous ability to adapt: we define ourselves through our innovative technologies, which distinguish us from our competitors. There is no reason to change that. For this, we must remain creative and agile. We have to retain the ability to adapt the processes and technologies to the needs of our customers at great speed. Ultimately, our development work is market-driven, there is a demand for our innovations.

However, I also see that our market environment is changing. And there is also a generation change taking place

among our customers and there are new trends with regards to products. It demands courage to embark on new paths, we simply have to understand this change as an opportunity. This is what made my predecessor stand out – and that is what I want to build on.

Our customers are increasingly thinking in terms of holistic projects. For us, this means that we have to see things from the perspective of our customer even more so than we have in the past. The closer meshing of our process technologies helps us provide our customers with even more comprehensive advice. We are at the very beginning of the textile value chain; just focusing on the products of our clientèle is no longer enough. Our customers expects us to carefully monitor the entire chain – all the way down to the end product itself.

» **Mr. Adler**, what trends do you see within the textiles industry over the next five years? Do you feel you are well-prepared for the future?

'Clothing oneself' remains a fundamental need for everybody. Increasing numbers of people want to clothe themselves, and fashion awareness increases with rising standards of living. By nature, cotton has limited possibilities, the cultivation areas increasingly having to compete with food production. Therefore, I assume that the fundamental trend towards substituting natural fibers with manmade fibers will continue. Here, the topic of plastics recycling will play an increasingly major role.

Overall, the product diversity of yarns and fibers will become ever more complex – with this, our project landscape will become more heterogeneous. With regards to the production processes, we are detecting a strong trend towards process simplification,

Our differentiation potential lies in the technology, in the productivity and in the added value for our customers.

without these changes fundamentally changing the end products. Automation and Industrie 4.0 – these are the topics that we are currently focusing on.

We have products on the market with unique selling points relevant to our customers and which we are continually expanding. Furthermore, we have numerous innovations in the pipeline in all our core processes. To this end, I very much believe that we are well-prepared for the future.

» **Dr. Schäfer**, as the Managing Director of the Barmag Brückner Engineering joint venture, you will continue to be associated with us here. What plans do you have for the company?

Barmag Brückner Engineering is an extremely well-functioning joint venture comprising Oerlikon Barmag and the Brückner Group. Over the past 20 years, we have considerably expanded the product portfolio and have been able to increase the turnover of the company tenfold in the process. And we remain on the growth track.

I am thrilled that I now have more time to focus on this task. Time to think how we can further optimize textile process technologies and engineering technologies to develop new solutions – this will also benefit BBE. (bey)



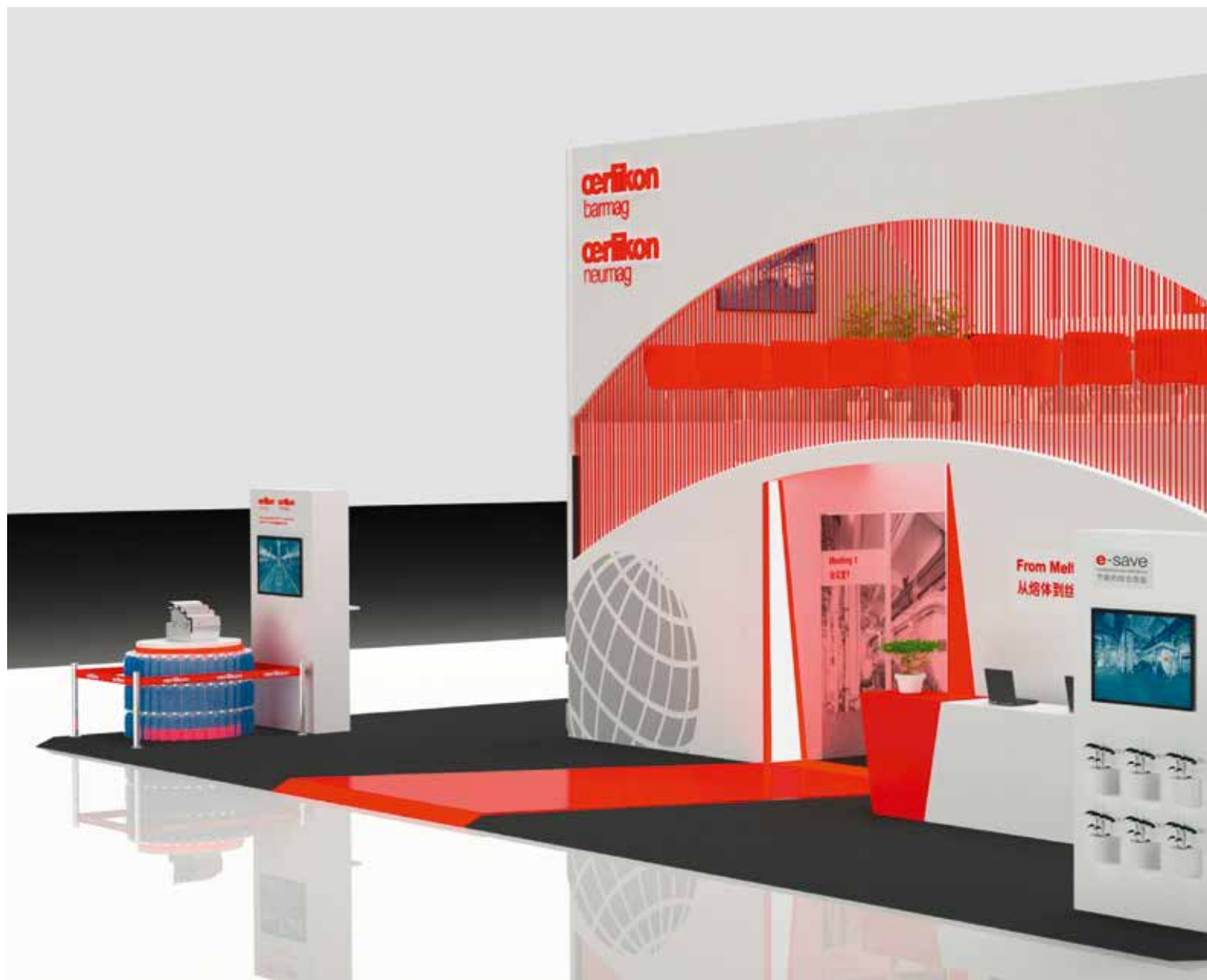
On January 1st, 2017, Dr. Klaus Schäfer (top) passes the baton to Jochen Adler.

Numerous new products and solutions at the ITMA Asia + CITME and ITME 2016

The Future is Now!

The textile world will be showing itself in world's two largest markets at the end of the year – China and India. With numerous innovations, the Oerlikon Manmade Fibers segment will be presenting itself at the ITMA Asia and the CITME between October 21 and 25 at the new National Exhibition Center China (NECC) in Shanghai and at the ITME in Mumbai between December 3 and 8 – in line with its leitmotif: 'From Melt to Yarn, Fibers and Nonwovens'.

The primary focus is on the innovative Oerlikon Manmade Fibers Industrie 4.0 system control and customer services solutions. With new features and offerings for the intelligent 'POC – Plant Operation Center 4.0' system control software, producers can now maintain a constant overview of all processes – from the polycondensation, spinning and texturing all the way through to downstream further processing procedures. This helps clients increase the productiv-



**ITMA H2 A16
ITME H1 A16 B15**



ity of their systems, save energy and deploy resources efficiently. Oerlikon already shows manufacturers how they can optimize the production processes of the future – ‘The Future is Now’.

Industrie 4.0 solutions blazing a trail

Using virtual reality presentation, augmented reality solutions with the recently-launched Microsoft HoloLens IT development for ‘predictive maintenance’ concepts and virtual 360-

degree tours through spinning plants, visits to both trade fairs will be offering everything that state-of-the-art technology makes possible today. Linked to future-oriented service and automation solutions, Oerlikon wants to prepare its customers for the future of manmade fiber production. The fact that this will ultimately result in improved yarn quality goes without saying for the market leader, along with offering environmentally-compatible and sustainable production processes. Here, the segment will be presenting its e-save initiative for



With its expanded godet system, the new WINGS POY HD winder has been designed especially for the requirements of high yarn titers of up to 500den polyester POY.



the 12th year in succession and showcasing new recycling solutions – ‘From shredded PET to value add’.

Oerlikon Barmag exhibiting a dozen innovations

The Oerlikon Manmade Fiber segment comprises two brands – Oerlikon Barmag and Oerlikon Neumag. With its many years of expertise in complex production systems engineering, Oerlikon Barmag – which focuses on CP, POY, FDY, DTY, industrial yarn (IDY) and tape and monofilament products and services – alone will be presenting 12 new manmade fiber spinning solutions at the two trade fairs.

A new addition to the WINGS POY and FDY family

The WINGS POY family now has a further new member, now also including the WINGS POY HD available for processing high titers. With its expanded godet system, the new winder has been designed especially for the requirements of high yarn titers of up to 500den polyester POY. In conjunction

with the EvoQuench radial quenching system, microfilament yarns with high titer ranges can now also be manufactured with outstanding properties.

Combined with the eAFK texturing machine – also designed for high titers – Oerlikon Barmag therefore offers a total ‘From Melt to Draw Textured Yarn’ concept that produces polyester DTY with up to 450den in accustomed Oerlikon Barmag DTY quality.

WINGS FDY PLUS

Since its market launch in 2010, the WINGS concept for FDY processing has successfully established itself on the market with a total of more than 4,000 installed spinning positions across the globe. Also being unveiled at the trade fair are ‘specialists’ for semi-dull and trilobal bright (WINGS FDY SD / WINGS FDY BR) tailored to the specific requirements of customers. The trade fair will also showcase the flexible WINGS FDY PLUS and WINGS FDY PLUS eco variant for a broader application window – depending on

the individual requirements, Oerlikon Barmag now offers the perfect, commercially-attractive solution.

Revolution: EvoQuench now also for polyamide processing

The EvoQuench radial quenching system – the core component within the polyester microfiber spinning process – has expanded its process window: EvoQuench is now also newly available for polyamide processing. With this development, Oerlikon Barmag is the first-ever supplier of systems for high-quality polyamide 6 micro-titers both for the POY and the FDY processes.

eAFK HQ – texturing in a new dimension

With the automatic eAFK HQ, Oerlikon Barmag will be presenting the world's most productive texturing machine at the ITMA ASIA. Furthermore, the new eAFK HQ simultaneously excels as a result of its extremely space-saving construction. With this, customers are able to texture their products in the tried-and-tested Oerlikon Barmag quality on a machine with the smallest space requirements per position in the DTY market. At the same time, they benefit from the 50% increase in productivity offered by the eAFK HQ compared to other texturing machines supplied by competitors.

The eAFK HQ is designed with 12 sections, each with 48 positions. Compared to the eAFK machine – with more than 1,000 successful installations worldwide – a fourth level in the winding unit of the eAFK HQ increases the capacity of the machine to 576 positions – a world record! And all this with simultaneously considerably reduced energy consumption. The newly-developed compact block heater lowers energy costs by reducing the radiated heat loss. With the highest level of precision, the new ATT traverse system ensures excellent package build.



In cooperation with Microsoft HoloLens the Manmade Fibers segment provides interesting Industrie 4.0 concepts for its customers.



WINGS FDY PLUS covers a broad process and application window.

Industrial textiles becoming increasingly popular

For the industrial textiles growth market, Oerlikon Barmag will be unveiling its latest developments for the production of yarns used in airbags, safety belts and tire cord. Here, the focus will, above all, be on polyamide 6 and polyamide 6.6 solutions. However, the very latest process and machine solutions will also be unveiled for polyester applications – for low shrinkage and high tenacity yarns, among others.

Special winders for carbon fibers and aramid

Furthermore, Oerlikon Barmag will be offering information on its winder portfolio for system modernizations and on the numerous special yarn winders for processing high-tenacity yarns, carbon fibers and aramid.

Oerlikon Neumag presents its expanded portfolio

For the first time since the announcement of the takeover of the Trützschler

synthetic staple fiber technologies, Oerlikon Neumag will now be presenting its fully-comprehensive staple fiber production portfolio as the leading supplier of technologies and plants within the global staple fiber market. Customers benefit from the best technology and process solutions for their specific requirements – for high-quality fibers from a single source.

Two new solutions for meltblown production

For the nonwovens (spunbond, meltblown and airlaid) sector, Oerlikon Neumag will be premiering two further innovations: the new, multifunctional forming table for the Oerlikon Neumag meltblown systems is characterized by its considerably reduced footprint. The resulting shortened belt length reduces maintenance costs. It is horizontally movable, multiply-segmented and offers individually-adjustable suction boxes. This enables extremely flexible formation and hence increased product diversity.



The FAUS operating unit for automating meltblown systems ensures an increase in both their productivity and reliability. Five different modes of operation with a total of eight different programs guarantee that future meltblown nonwovens can be manufactured even more efficiently.

**BCF solution:
energy savings of up to 50%**

With its BCF plants, the three-end S+ and the single-end Sytec One, Oerlikon Neumag fully covers all requirements of internationally-active carpet yarn manufacturers. While the S+ is a convincing solution for commercial applications, the Sytec One is particularly good for demanding production processes due to its monofilament character. Both plant types can be equipped with the RoTac tangling unit. Depending on the yarn type, the compressed air consumption is reduced by up to 50% compared to conventional tangling units to ensure energy-efficient production. (aw, bey, che, wa)



United Arab Emirates increasingly focusing on industry

Standard Carpets modernizes on a grand scale

An old hand in the BCF sector simply had to be part of the new Dubai Industrial City: Standard Carpets, a leading carpet manufacturer of the MENA region, uses the new development to expand and modernize its production site.

A new industrial city is being created in the middle of the desert in the Emirate of Dubai. This is an opportunity for the small country to be perceived as an industrial hub rather than merely as a center of trading as has been the case to date. And Standard Carpets, successfully active in the carpet sector for almost 20 years now, will also be relocating its production site to the Dubai Industrial City (DIC). Beginning this summer, two new BCF systems will be assembled at DIC, with three existing systems at the production site to date then being dismantled, modernized and reassembled at the new plant as well.

For this comprehensive project, the vertically-integrated company has chosen Oerlikon Neumag to be its partner. V. Bhushan, Managing Director from Standard Carpets, was convinced by the technology of the Neumünster-based systems manufacturer: "We have chosen the S+ as our latest investment. The concept was simply compelling in terms of efficiency and product diversity." In future, the five systems will be used for manufacturing polypropylene, polyester and polyamide 6 yarns.

Decisive for the decision was undoubtedly also the company's many years of experience with Oerlikon Neumag

systems. The order scope includes the new systems and modification packages for modernizing the three already existing systems along with engineering services. "For us, there are significant benefits to having just one contact partner for the entire project. It means considerably fewer frictional losses, no scheduling problems and ultimately a total solution with which we can immediately start manufacturing quality yarns. With Oerlikon Neumag, we have a partner who can provide us with both innovative technology and, above all, with reliable process know-how and the support of a comprehensive portfolio of customer services", explains V. Bhushan.

Quality is at the very top of the list of priorities for the market leader in the region, established in 1997. From yarn extrusion, twisting, tufting all the way through to the product backing, Standard Carpets carries out all manufacturing steps in-house. This, according to



Standard Carpets carries out all manufacturing steps in-house.

the experience of the trend-setter from Dubai, guarantees the quality and consistency of its products from raw based materials to finished goods.

And its strong commitment to sustainable products and production processes is based on quality. To this end, the three pillars of the company-internal "Sustainability through Quality" program are durability, recycling and clean processing. With this, the company – which exports its machine tufted carpets, carpet tiles and artificial grass to more than 60 countries internationally – complies with the spirit of the age. Holding international standards certifications ISO 900:2015, OHSAS 18001:2007, and ISO 14001:2015 the company consciously reduces water waste pollution by choosing to only manufacture solution dyed fibers. In addition, many of Standard Carpets' products fulfill the requirements of both the Carpet and Rug Institute's (CRI) Green Label Plus Program as well as

the Building Research Establishment's (BRE) Environmental Assessment Method.

"We constantly strive to minimize negative impacts on the environment. This also encompasses the products that we manufacture and, above all, also how we manufacture them. These are the principles on which we base the selection of our partners", explains V. Bhushan, describing the philosophy of his company. (bey)



A city of its own: Standard Carpets' new production site in Dubai



Automotive sector with growth potential

Airbag yarns on the rise

According to estimates from Business Wire, the demand for airbags will increase by 5 percent annually over the next five years. To date, airbags have been predominantly manufactured using polyamide 6.6 yarns. However, there is a noticeable trend with these challenging industrial filament yarns towards polyester.



Industrial yarn producers are increasingly perceiving the airbag yarn segment as a growth market. To this end, four projects for manufacturing airbag yarns from polyamide 6.6 (PA6.6) and polyester (PET) supplied by systems builder Oerlikon Barmag have been successfully commissioned in the past 12 months alone. The systems – installed at well-known yarn manufacturers in North America and China – cover titer ranges of between 235 and 700 dtex for PA6.6, and between 470 and 550 dtex for PET.

The systems concept offers the highest level of flexibility: the proven SP4 spinning system with exchangeable melt distribution enables the conversion of the airbag yarn systems from PA6.6 to PET or vice-versa without much effort. To this end, yarn producers can react flexibly and swiftly to changing market requirements.

Market with growth potential

The reason for the increased demand for airbag yarns is the global rise of road safety requirements. Within this context, the Indian government and

the Department of Road Transport and Highways, for example, have revised their vehicle safety rules and regulations. The new version, which comes into force in the fall of 2017, demands considerably greater occupant safety, particularly with regards to side and front impact. According to the estimates of numerous automobile manufacturers, compliance with these new safety rules and regulations can only be achieved with the installation of airbags.

And, according to research conducted by PCI, greater safety in vehicles is also a much-discussed topic in Latin America, which is having a positive impact on the airbag and safety belt manufacturing industry: two South Korean airbag producers have already announced investments in Central America.

The average volume of textile fibers and filaments in automobiles is around 30 kg; according to PCI Fibres, just under 19% of this is airbag yarn. This opens up a highly-profitable growth market for industrial yarn manufacturers. (bey)

Oerlikon Barmag at the K 2016

New products enable profitability increases of up to 50 percent

Solutions for tape and monofilament manufacturing are the primary focus of the Oerlikon Barmag trade fair stand at this year's K in Düsseldorf. Between October 19 and 26, customers will furthermore be able to inform themselves of the new high-speed extruder pump, which enables considerably higher throughputs at reduced investment costs.

Tape yarns for diverse applications

The focus of the new developments lies on the EvoTape tape system in conjunction with the automatic WinTape tape winder and – as a trade fair innovation – on an automatic baler twine yarn winder. The combination of tape system and winder is not only convincing for carpet backing and geotextile processes, it now also provides significant profitability increases of up to 50% compared to standard market systems for baler twine yarns.

And there are also efficient solutions available for sack and big bag fabrics in the form of the EvoTape 800 and the WinTape mini.

Revival of the artificial turf market

Considerable growth in the artificial turf market in the past year has triggered increased demand for monofilament production solutions. Once again, Oerlikon Barmag offers manufacturers customized solutions here: from the spinning plants to texturing, spiral wrapping all the way through to twisting, Oerlikon Barmag takes care of the entire process.

High-speed extruder pump for higher throughputs

The pumps specialists at Oerlikon Barmag will be unveiling the new high-speed extruder pump, whose increased speeds enable a considerably larger throughput setting range, while simultaneously reducing pulsation.

Furthermore, the reduced friction surfaces ensure lower melt temperature increases and hence more efficient and energy-saving production.

Concentrated flexibility – the GM 'E' gear metering pump

The GM series pumps were developed especially for use under challenging conditions. The latest member of this robust family of pumps is the GM 'E' type pump.

With its larger setting range, the 'E' type pump caters to a considerably broader production window. For manufacturers of various components made from polyurethane systems – such as block foam for the production of mattresses, for example – this means that the number of required pumps can be reduced by up to 50 percent. With regards to the individual pump type, the flexibility in production is also increased. (wa)



Perfect double: the tape system EvoTape and the automatic tape winder WinTape convince with significant profitability increases for a broad range of processes.

“German Technology meets Vietnamese Textiles” 2016

At the beginning of July, textile sector owners, decision-makers and experts gathered for a symposium entitled ‘German Technology meets Vietnamese Textiles’, hosted by the German VDMA.

The symposium was held over three different days – first in Hanoi, with approx. 250 industry participants, followed by Ho Chi Minh City, with approx. 350 participants, and concluded with a training and exchange session for 200 students at the Ho Chi Minh City University of Technology. The events were supported by the VITAS (Vietnam Textile and Apparel Association) and various media partners.



The VDMA symposium was one of many recently held in Vietnam by industrial organizations from different countries in the wake of the signing of the TPP (Trans-Pacific Partnership). But it was the one with by far the highest attendance and industry interest, showcasing the significance of German Textile Machine Manufacturers for the Vietnamese textile industry and reflecting the footprint already held by the sector in Vietnam.

The TPP will reduce 18,000 tariffs over 5 years, with the majority relating to textiles coming into force from the very start. Vietnam is almost a sole supplier of textiles among the Trans-Pacific Partnership member countries and an important supplier of textiles and garments to major consumer markets such as the US and Europe. In addition to the TPP, Vietnam has signed free trade agreements with the EU and Japan among others over the past few years and – as part of ASEAN – now offers one of the greatest growth potentials of all Southeast Asian countries. Textile and garment exports from Vietnam to the TPP markets alone are expected to grow by more than 10 percent in 2016/2015.

Representatives of 24 participating VDMA member companies provided information in their lectures about state-of-the-art technology along the entire textile chain for natural and manmade fibers – including spinning, knitting, weaving, nonwovens, dyeing & finishing.

Higher productivity, sustainability (energy, water, and material efficiency), new textile applications, quality improvements as well as ‘Industrie 4.0’ were the main focus of most of the lectures.

The response of visitors was very positive. This was also the summary of the officials: “Vietnam needs the high quality and efficiency of German machines to further invest above all in fabric production and dyeing & finishing”, stated Mr. Truong Van Cam (Vice President and General Secretary of VITAS) during the panel discussion in Hanoi. “This will help the textile and garment industry to meet the local content requirements and to benefit from free trade agreements such as the TPP”. (as)

The Oerlikon Manmade Fibers ‘From Melt to Yarn, Fibers and Nonwovens’ lecture started with a general review of the special economic conditions in Vietnam that have led to recent and pending major investments in the textile sector before showing and explaining OMF’s solutions that contribute to the success of our customers such as:

- EP and EPC services for continuous polymerization plants
- Oerlikon Neumag spinning and processing solutions for
 - Staple fibers
 - Nonwovens
 - BCF
- Oerlikon Barmag filament spinning and processing solutions with
 - WINGS POY for PET and PA
 - WINGS FDY
 - Manual doffing eFK draw-texturing machines
 - Automatic doffing eAFK draw-texturing machines
- Oerlikon Manmade Fibers service solutions including
 - Global network of service stations
 - State-of-the-art online machine servicing solutions
 - Industry 4.0

Noticeable staple fibers boom in India

Staple fibers have been in very high demand in India since the end of last year. The reason for this is generally deemed to be the high quality requirements within the country.

Demand for cotton-type fibers has particularly increased. Market observers anticipate that the demand for this type of fiber – which is deployed in the apparel industry – will continue to grow.

While Indian fiber manufacturers' machine plants have to date been dominated by systems with small capacities, the strong demand for cotton-type fibers will bring about a trend towards systems able to cope with more than 200 tons per day. "If Indian manufacturers wish to efficiently produce staple fibers with the required quality, they should invest in larger systems", comments Gerrit van Loenen, Sales Director at Oerlikon Neumag,

assessing the current market situation. "Indeed, we have seen an accumulation of inquiries for such systems. Particularly in the 200 to 300 tons per day systems range, we have extremely convincing arguments when it comes to OPEX and return-on-investment (ROI)."

The Neumünster-based systems constructor is virtually peerless when it comes to large-scale systems. With its two-step concept with capacities of up to 300 tons per day, Oerlikon Neumag is above all providing quality-conscious manufacturers with efficient and cost-optimized solutions. The fundamental competitive advantage of large-scale systems – for 200 tons per day and more – for commodity fibers is the

considerably higher profitability per ton of fiber compared to smaller systems, which is above all the result of the system's energy efficiency.

The Oerlikon Neumag technology offers a further ecological and cost benefit with the possibility of dyeing fibers directly during the spinning process. If large systems are connected to a polycondensation system, fibers can normally only be dyed in downstream processing. In contrast, the masterbatch can be directly added to the spinning process when using a side stream extrusion system. This enables dyed fibers to be directly manufactured with subsequent, downstream dyeing no longer required. (bey)



Oerlikon Neumag is the undisputed market leader when it comes to large-scale systems.

oerlikon
barmag

oerlikon
neumag

imprint

Fibers and Filaments is the exclusive Oerlikon Manmade Fibers customer magazine. It is published three times per year by

Oerlikon Textile GmbH & Co. KG

Leverkuser Straße 65
42897 Remscheid
Germany

fibers.filaments@oerlikon.com
www.oerlikon.com/manmade-fibers

Edition

2,600 copies

Editorial staff

as André Steingass
aw André Wissenberg
bey Susanne Beyer (responsible)
che Claudia Henkel
jli James Li
lat Michael Latinski
mks Manisha Khosla Sinha
sbu Sonja Buchholz
wa Ute Watermann
zhm Zhong Ming

Concept and layout

Make and Do, Hella Hölzer
www.make-and-do.de

Print

Köllen Druck + Verlag, Bonn
www.koellen.de

Photography

Ralf Buchholz, Rickey Steele,
Manisha Khosla Sinha,
Jens Weinhold, Standard Carpets,
Dastranj Reza Baft, private,
company archive

Dimuthu Jayawickrama/xtock/
Anton_Ivanov/Dmitry Kalinovsky/PI/
Kzenon (2)/hxdbzxy/Tasoph/
Shutterstock

Disclaimer

All indicated values and descriptions in this document are for indicative purposes only and not to be understood as a guarantee. Please note that actual values may differ from any data published in this document.

Electronic Version (PDF)



We print our publications on high-quality recycled paper using CO₂-neutral methods. The paper is called 'revive' and is supplied by 'Deutsche Papier'.

Print  compensated

Id-No. 1658707
www.bvdm-online.de