

fibers and filaments

the experts' magazine

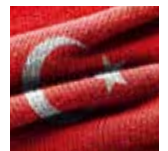
issue 21 – may 2015



Turkey - a true textile country

Growth in the Turkish textile industry exceeds expectations

Turkey ranks as the 5th largest textile and apparel exporter globally.



Success with customized service solutions

Talking to Tilman Seidel and Niels Herrmann

Fibers & Filaments spoke to Tilman Seidel and Niels Herrmann about systems modernization options and their benefits.



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

Zhang Jian
Aftersales Service Engineer



Partnering for Performance

Oerlikon Manmade Fibers provides a comprehensive range of services, tailor-made to our customers' individual requirements. From a global network of service stations, to 24/7 hotline support, you can be sure that we are there for you – **partnering for performance.**



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Editorial



Dear Customers, dear Readers,

Our markets are in a state of constant flux. Currently, the major systems market is shifting in favor of specialists. In demand are particularly end applications, special yarn properties, exceptional processes and system configurations.

Reason enough to take a closer look at the markets in which we are active. We have chosen the geographic approach and are starting this edition of Fibers & Filaments with Turkey, a true textile country. Drawing on a long textile history, Turkey has developed into a strong location for modern manmade fiber manufacturing. Here, the country is able to offer USPs with its proximity to Europe and its high-quality yarns and textile end products.

You can also read about industrial textiles, yarns and processes, an area that offers unimaginable possibilities – something that will be on display at the next Techtextil. In many areas, textile structures are on the rise and are increasingly being deployed to provide safety.

Further highlights of this edition include our service offerings. Service and maintenance contracts and retrofit solutions provide our customers with considerable benefits: in filament spinning, texturing and carpet manufacturing, efficiency and economy and also superior yarn quality can be achieved with manageable investments. Read about how the CreelManager will improve the quality of your DTY and how the RoTac³ will manufacture your BCF yarn more efficiently.

We are thrilled to be able to present you with yet another magazine with a whole array of exciting topics. And we hope you enjoy reading this edition of Fibers & Filaments.

With best regards,

Georg Stausberg
CEO Oerlikon Manmade Fibers Segment

10th China Textile Round Table Forum 2015 Focus on sustainability

The tenth anniversary of the Annual Meeting of China Textile Round Table Forum, again sponsored by Oerlikon Manmade Fibers Segment, was held on January 31, 2015 at the Beijing Capital Hotel. Ten years have passed by since Oerlikon Barmag first sponsored this high-end forum. China Textile Round Table Forum is organized by the CNTAC and hosted by the China Textile Economy Research Center and the News Center of the CNTA.



This year, Oerlikon Manmade Fibers Segment CEO Georg Stausberg presented the results of the exclusive 'Sustainable growth through value innovation' study to more than 300 attendees. His presentation supplemented the motto of the event: 'China's Textile Industry under the New Normal'. The study investigates the potential savings for the Chinese textile industry if outdated machinery were to be replaced with modernized technologies. The continuous development of Oerlikon technologies has generated high economic benefits that include energy savings, reductions in CO₂ emissions, land savings and productivity increases. "All in all, this study shows that Oerlikon Barmag's and Oerlikon Neumag's latest technologies can support China in achieving its energy saving potentials and support the people in having a better and cleaner living environment", stated Georg Stausberg. (aw)



Georg Stausberg discussed with Wang Tiankai, President of CNTAC the solutions of Oerlikon's Segment Manmade Fibers for "sustainable growth through value innovation".

Customer Day in Gaziantep RoTac³ convinces

The Turkish carpet yarn world met up in Gaziantep on March 18. Around 80 invited guests accepted the Oerlikon Neumag invitation to the local cultural center. The topic of the Customer Day there was – as had already been the case in Hanover – the new RoTac³ tangling unit.

The evening was hosted by Oerlikon Neumag Head of Customer Services, Tilmann Seidel, Senior Sales Director and Turkey expert Arnd Luppold explained the commercial benefits of the RoTac³, which was unveiled for the very first time at this year's Domotex trade show. Head of Service Sales Niels Herrmann spoke of the unit's sophisticated technology, while service expert Björn Mäkelburg talked about the retrofit options for existing systems. Turkey is one of the largest markets for S+ type BCF systems. More than 70 retrofitable S+

systems in Turkey alone explain the audience's tremendous interest in the topic of modernization and retrofit solutions in particular. Due to local market conditions, Turkish BCF manufacturers are subject to increased pressure on margins, meaning that – with a system upgrade that comes with a relatively low investment – they can now enjoy considerable advantages and tremendous improvements in energy efficiency and economy as a result of a new USP with regards to yarn quality. (che)



Techtextil Frankfurt 2015 Innovative industrial solutions for technical textiles in growth markets

techtextil



At this year's Techtextil, taking place in Frankfurt between May 4 and 7, the Manmade Fibers Segment of the Swiss Oerlikon Group will be placing the information focus on safety and environment. The solution provider with its two brands – Oerlikon Barmag and Oerlikon Neumag – offers numerous technologies for manufacturing industrial yarns, fibers and nonwovens. The latest developments among other things for recycling will be presented at the 90 m² booth in hall 3, B06, in a Virtual Showroom in 3D.

Automobile tires, safety belts, airbags, geotextiles, roofing membranes, guy ropes for drilling platforms, conveyor belts, sails and fishing nets – all these are manufactured using industrial yarns and nonwovens. Even this selection of applications showcases the diversity of what is possible in potentially the most exciting area within the textile sector. (bey)

Domotex 2015 in Hanover Oerlikon Neumag presents new tangling unit RoTac³

Domotex – where trends are set. The trade fair in Hanover is considered to be globally-leading for carpets and flooring and is as such a meeting place for many international trade visitors. Between January 17 and 20, 2015, around 1,350 exhibitors from more than 60 countries unveiled their product innovations at the show. With around 40,000 visitors from almost 100 different countries, the Domotex was once again well-attended this year.



This year, Oerlikon Neumag presented its S+ BCF system along with something truly special: The new RoTac³ tangling unit generates the tangling knots by a discontinuous compressed air impulse instead of a continual one and therefore permits a reduction in compressed air consumption of up to 50 percent depending on the yarn type. And the new component is also most convincing in terms of yarn quality. With this new technology concept, the yarn acquires its tangling knots in defined spacings and tenacities.

RoTac³ in virtual reality
Interested trade visitors were treated to an insight into the insides of a BCF system equipped with the new RoTac³ at the virtual reality showroom. The presentation of the hotly-anticipated tangling unit convinced both customers and the press. To this end, it hardly came as a surprise that there was one sentence being repeated around the trade fair booth attracting further customers to the Oerlikon Neumag exhibits: "Have you seen the new product movie?" (mn)



Must-See booth at the Domotex: the Oerlikon Neumag booth

RoTac³ is the focus of the BCF Symposium

This year, the Oerlikon Neumag BCF Symposium took place for the tenth time. On the occasion of this momentous anniversary, the Neumünster-based systems constructor invited customers, representatives and business partners to the EXPOWAL event location in Hanover on the penultimate day of the Domotex trade fair. This extraordinary venue welcomed the around 130 invited guests to an evening full of magic: bathed in floodlight, Oerlikon Neumag presented the RoTac³, which is being unveiled to the world at the Domotex for the very first time. Practically by 'magic', the component – which is particularly convincing with its energy efficiency – was presented by a conjurer. The RoTac³ and its creators were introduced to the enthused audience in an audiovisual extravaganza. The sophisticated technology was explained by Head of BCF Development Mathias Stündl in his presenta-



Essential for the success of the innovative RoTac³: the people involved in its development.

tion on the new tangling technology for manufacturing BCF yarn with the RoTac³. Numerous technical discussions following the BCF Symposium

– which this year was more of a RoTac³ night – clearly demonstrated that this development seems to have hit the right nerve. (mn)

Retrofit project brings first WINGS take-up machines to Pakistan

Within the context of a comprehensive retrofit project, 15 WINGS POY take-up machines were successfully commissioned at Pakistani polyester yarn manufacturer Gatron (Industries) Ltd. 37 more will follow in the autumn of this year, with yarn production commencing before the end of 2015. The 48-position + 3 spare winders project comprises WINGS POY take-up machines 1500/12-end and WINGS 1200/8-end units especially designed for system upgrades. With the conversion to the new WINGS winder technology, the system at Gatron is the first in Pakistan to deploy this technology. The modernization of further core components – such as spinning beam and quenching system – are under discussion.



Gatron's Taufiq Bilwani (third from left) is happy with his new WINGS technology and the good cooperation with Oerlikon Barmag's Jilali Lakraa.

Gatron has specialized in manufacturing polyester yarns for the local market and the yarns are deployed predominantly in the production of apparel and

home textiles. With a capacity of 120 tons of filament yarn a day and titers ranging from between 45 and 1000 denier, the company is the largest polyester filament yarn manufacturer in Pakistan. Along with filament yarn it produces polyester textile grade chips and PET resin & preforms. Gatron belongs to a group of companies: G & T - Gani & Tayub is in business since 1948 as a leading name in polyester filament yarn & chips and PET resin, preform, bottle, film, sheet & thermoforming products.

Further, Gatron is well equipped with the latest DTY technology: The yarn is textured in-house using Oerlikon Barmag texturing machines including

VarioFil R+ sets new standards for PET recycling

At its Open House on January 21, Remscheid-based Barmag Brückner Engineering GmbH (BBE) placed the focus on polyester recycling. During the event, the 120 invited guests witnessed the premiere of the new VarioFil R+ spinning system in action. As the first of its kind in the world, this compact system produces POY that is manufactured directly from recycled flakes. With



this, the VarioFil R+ cuts out an entire process step, making the efficient spinning of recycled materials even more interesting.

The system with its four spinning positions stands out with various technological features: a special extrusion system for bottle flakes, the latest metering and mixing technology for spin dyeing and an advanced two-stage melt filtration unit prepare the recycled polyester for reuse. The yarn is then drawn and taken up using WINGS POY 10-end winders manufactured by Oerlikon Barmag. The high-end, excellently-compatible components guarantee superlative yarn quality and efficient production. (mb)

VarioFil R+ is the first POY spinning system that produces yarn directly from recycled flakes.

Events

Anex / Since

May 13-15, 2015, Shanghai, China
booth S60

www.anex2015.com

Domotex Gaziantep

May 25-28, 2015, Gaziantep, Turkey

www.domotexturkey.com

5th World Carpet Congress

May 28-29, 2015, Ghent, Belgium

www.worldcarpetcongress2015.be

ShanghaiTex

June 15-18, 2015, Shanghai, China
booth E1, hall 30

www.shanghaitex.cn

Achema

June 15-19, 2015, Frankfurt, Germany
booth E4, hall 8

www.achema.de

Intertextile – hometextile (Autumn) Shanghai

August 26-28, 2015, Shanghai, China

www.intertextilehome.com

PU-China

August 31 – September 02, 2015,
Guangzhou, China

booth 230

www.utech-asia.com

Techtextil India

September 24-26, 2015,
Mumbai, India

www.techtextil-india.in.messefrankfurt.com

China International Recycled Polyester Conference

September 16-18, Shanghai, China

www.ccfci.net



the latest godet version eFK machines. Gatron operates continuous polycondensation system and manufactures via direct melt spinning filament yarn along with polyester chips for its own consumption. As a result of the integration of the upstream polymer production, Gatron is able to exert a considerable influence on the quality and price of the processed polymer.

The fact that quality is a decisive factor behind the many years of collaboration with Oerlikon Barmag is confirmed by Director Mr. Muhammad Taufiq Bilwani: "We have been working with Oerlikon Barmag for almost 30 years now; once again, we are thoroughly convinced by the system performance and the

service. The yarn parameters are – as expected – excellent and the assembly and commissioning were also swift and unproblematic. With this retrofit solution, we are able to achieve so much more in terms of yarn quality and system productivity with a comparatively low level of investment." (bey)

Growth in the Turkish textile industry exceeds expectations

The Turkish textile industry, full steam ahead!

Contributing over 10% of GNP, making up about 20% of the overall exports and generating about 15% of total employment, the textile and apparel sector is the key industry and a major player for Turkey's economy.



Regional development of the Turkish textile industry

Employing an estimated 2 million people, formally about 1 million according to SSI of Turkey and around a further 1 million informally, at nearly 58,000 active companies, the textile and apparel industry in Turkey is concentrated around the cities of Istanbul, Bursa, Denizli, Gaziantep, İzmir, Usak, Tekirdag, Kahramanmaras, Adana and Kayseri.

When the clustering activities of the Turkish textile industry are analyzed, we can see that floss silk, manmade filament yarn and fabric production is clustered around Bursa, which was historically the silk center of the Ottoman Empire; towel, bathrobe and home textile production is focused around Denizli; woolen, worsted and semi-worsted yarn and blanket production around Usak; finishing and particularly circular-knitted product finishing around Tekirdag; cotton weaving and finishing in Adana; cotton yarn and particularly open end yarn in Kahramanmaras; polypropylene, nonwoven and machine-made carpet manufacturing in Gaziantep and finally circular knitting, knitwear and hosiery as well as apparel and garment manufacturing around Istanbul.

A consistent improvement in the exports of all textile related articles

The continuous increase in textile and apparel exports from Turkey over the years has not only contributed to the growth in industrial export earnings, it has also contributed to the reduction in the current trade deficit of Turkey. Thanks to the textile and apparel industries together, Turkey generated export revenues worth about 29 billion US\$ in 2014, with realized imports worth about 13 billion US\$, managing to reduce the trade deficit by 16 billion US\$. Thanks to the additional tax reduction for the imports of several textile articles that

According to UN Comtrade, Turkey ranks as the 5th largest textile and apparel exporter globally, following China, India, Italy and Germany respectively. Turkey also enjoys being the 3rd largest hosiery and 3rd largest towel supplier in the world, as well as the largest home textile manufacturer in Europe. Gaziantep, one of the major textile regions of Turkey, alone produces about 57% of all machine-made carpets produced worldwide. Turkey was also the eighth largest cotton producer in the world in the 2013/2014 crop year, with 501,000 metric/tons of cotton and is forecast to rise to the seventh with an estimated 700,000 metric/tons with the 2014/2015 crop year. With an installed capacity of

around 3.5 million/tons, Turkey reaps the benefits of having the highest fiber and yarn production capacity in Europe. About 65% of this capacity is cotton, 35% manmade filament and 10% wool and others. Thanks to its remarkable capacity also in manmade yarns and fibers, Turkey became the seventh largest producer globally with an estimated annual production of 1.3 million tons in 2014. The point that the Turkish textile sector has reached today regarding quality, fashion and design cannot be underestimated.

A deep-rooted history in the textile industry: from Antiquity to Turquerie

The archeological evidence of primitive weaving looms verifies that textile manu-

facturing in today's 'Anatolia' goes back to Antiquity and as far back as 2000 BC. The development of the textile industry in Turkey goes back to Ottoman, even Seljuk times. Turkish textiles began to attract Europeans even during the Ottoman times and influenced the Turquerie movement in Europe between the 16th and 18th Centuries, an Oriental fashion that imitated Turkish art and culture. Turkish textiles even became a luxury for the elitist European homes. We can also see Ottoman influences in European silk and cotton weaving in that period. However, as Indian cotton started to replace Turkish cotton and Turkey started falling behind the technology of the Industrial Revolution, this dealt a major blow to the textile industry during the final years of the Ottoman Empire.

came into force in April 2011, textile and fiber exports have accelerated over the last 4 years, reaching a pinnacle at the end of 2014 when the foreign trade balance surpassed 42 billion US\$.

Whereas woven fabrics make up the largest share in Turkish textile exports, knitted fabrics, yarn and home textile exports also make a significant impact. Russia, Italy, Germany, Romania and Spain ranked as top markets respectively with regards to woven fabrics. For knitted fabrics, Italy, Russia, Ukraine, Bulgaria and Romania led the textile export markets for Turkey. Finally, Italy, the UK, Belgium, Germany and the Netherlands ranked among the top importers of fiber and yarn from Turkey.

On the other hand, Turkey was ranked the number one importer of manmade fibers and yarns in 2012, with an about 7.7% share in total world imports ahead China. Fiber and yarn imports account for one-third of Turkey's total textile imports. Whereas Turkmenistan, Egypt and Uzbekistan make up the biggest share of Turkey's cotton fiber and yarn imports, China, India and Vietnam lead the list when it comes to manmade fiber and yarn imports.

The textile industry received even more support from the government in 2014

The government provided grants of about 8 billion US\$ worth of investment incentives to the textile sector during

the period between April 2011 and July 2014. Only 1.5 billion US\$ of investment incentives was provided over the period between January 2014 and July 2014. Here, we should point out that the manmade fiber industry has continued to suffer with regard to incentives due to the legislation of the Customs Union and the EU.

The support instruments provided to the overall textile industry within 4 different investment incentive schemes included VAT exemption, customs duty exemption, tax reduction, social security premium support (both employer's and employee's share), income tax withholding allowance, interest rate support, land allocation and VAT refund. However, the foreign direct investment (FDI) flows within the textile industry appeared to be at very low levels. Last, but not least, the Turkish government strongly outlined its support for the textile industry in the tenth five-year development plan covering the 2014-2018 period, which was approved in the Grand National Assembly of Turkey in July 2013, and the supporting of the transformation of textiles, clothing and leather sectors into a structure in which firms are customer-oriented, innovative, environment-friendly, effective in marketing and production channels, able to enrich

The well-trained and highly-skilled workforce of the Turkish textile industry attracts European customers.



thomas koch/Shutterstock.com

The textile and apparel industry is significant as one of the key industries in supporting the achievement of the target to increase Turkey's total exports to 500 billion US\$ by 2023, the year in which the Turkish Republic is celebrating its centenary.

their productive features by speed and flexibility and able to create their own designs, collections and brand was highly emphasized in the plan.

The Turkish textile industry offers significant benefits over the European markets

Today, the Turkish textile industry is pointing the way and opening up new perspectives for the world, particularly the European textile industry. There are a large number of competitive advantages making Turkey an important textile location for Europe. The geographical proximity of Turkey to the European markets is of utmost importance. This not only contributes to shorter delivery times of between two and three weeks compared to between two and three months for China, it also helps the Turkish textile manufacturers respond quickly to the challenging demands of European customers. The state-of-the-art textile infrastructure in Turkey helps to meet diversified product ranges with high value-added products. The well-trained and highly-skilled workforce of the Turkish textile industry, equipped with immense know-how and a global mindset, also attracts European customers. The manufacturers ensure full compliance with internationally accepted ecological standards. Last, but not the least, Turkey became a full member of the Customs Union in 1996, after a 22-year transition period.

Thanks to all these unique features of the Turkish textile market, it is today a major sourcing country for many global European brands such as Esprit, H&M, S.Oliver, Adidas, Zara and Hugo Boss, whose subsidiary in Turkey became one of the largest companies in Turkey in 2013.

thomas koch/Shutterstock.com

Largest 20 textile manufacturing companies of Turkey

Company	Location	Activity of Field	Net Sales in 2013 (USD)*
AKSA Akrilik	İstanbul	Synthetic Fibers	837000000
Sanko Tekstil	Gaziantep	OE Fibers	707000000
Sasa Polyester Sanayi	Adana	Synthetic Fibers	535000000
Gülsan Sentetik Dokuma	Gaziantep	Synthetic Fibers, Carpets	418000000
Korteks Mensucat Sanayi	İstanbul	Synthetic Fibers	322700000
Kıpaş Mensucat İşletmeleri	Kahramanmaraş	Fibers, Denim, Fabrics	305054000
Beyteks Tekstil Sanayi	Adana	OE, Combed cotton	298589000
Kordsa Global Endüstriyel İplik	İstanbul	Synthetic Fibers	285000000
Zorluteks Tekstil	İstanbul	Polyester fiber, cotton weaving	270169000
Merinos Halı Sanayi	Gaziantep	Carpets	241282000
Menderes Tekstil Sanayi	Denizli	Cotton weaving	222297000
Orta Anadolu	Kayseri	Denim fabric	216109000
Boyteks Tekstil	Kayseri	Fabric, carpets	192970000
Yakupoğlu Tekstil ve Deri San.	Ankara	Boots	169198000
Bossa	Adana	Ring spun yarns, denim, fabrics	168978000
Hugo Boss Tekstil Sanayi	Ege Bölgesi	Apparel	168585000
Yeşim Tekstil Sanayi	Bursa	Apparel	154750000
Matesa Tekstil Sanayi	Kahramanmaraş	OE and Ring-spun yarns	149490000
Aunde Teknik Tekstil Sanayi	Bursa	Automotive textiles	145900000
Gürteks İplik Sanayi	Gaziantep	Synthetic Fibers, Carpets	142900000

* Net TL sales in 2013 are converted to USD with average 2013 USD rates of Central Bank of Turkey

Source: Istanbul Chamber of Commerce – largest 500 companies of 2013

A brief glance at the development of the manmade fiber and yarn industry in Turkey

Despite the fact that first cellulosic fiber (viscose) production began in the state-owned Gemlik Sungipek factory in 1938, the manufacturing of manmade fibers started after the 1960s. Sifas, located in Bursa, had the first ever manmade yarn production facilities in Turkey in 1964 under the name Turlon, which became the first registered Nylon-6 yarn brand in the country.

SASA, Turkey's first petrochemical company, integrated polyester fiber production at Adana in 1966. Today, SASA still maintains its leading position in the manmade fiber industry with a 44% market share in Turkey. AKSA's establishment in 1968, to meet the demand for acrylic fabrics in Yalova, became another milestone in the manmade fibers manufacturing history of Turkey. Whereas the share of polyamide fibers was higher in the beginning, later the ratio of acrylic and polyester surpassed polyamides.

Today, Bursa alone is responsible for more than 70% of manmade fiber production in Turkey. SUSEB, Union of Artificial and Synthetic Fibers, an NGO established to preserve the rights of manmade fiber manufacturers, is

Bursa alone is responsible for more than 70% of manmade fibers production in Turkey.



also located in Bursa. Thanks to its outstanding position in textile finishing, most of the yarns are further processed within Turkey; processes including finishing, dyeing, heat-setting, etc. With more than 600 active companies, the textile finishing industry in Turkey ranks second globally after China.

The Turkish manmade fiber industry hit by the MFA and China's WTO membership

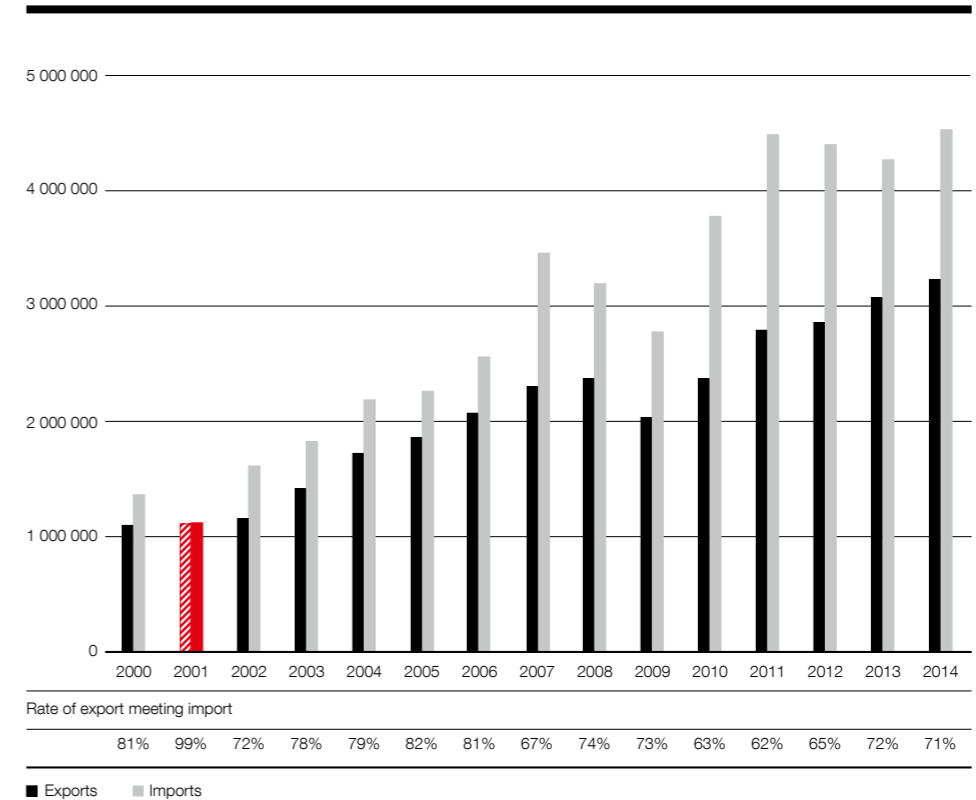
MFA (The Multifibre Arrangement), signed in 1974, was the first major blow for the Turkish manmade fiber industry. Global textile quotas were eliminated at the same time as the abolition of the MFA in 2005. Turkey took advantage of this somehow, but this benefited China, which was granted membership in the WTO in 2001, allowing it to dominate the world markets.

In this regard, Turkey has currently imposed several anti-dumping taxes on the imports of textured yarn of nylon and other polyamides (measuring more than 50 tex per single yarn) from China, textured polyester yarn from China, Indonesia, Malaysia and yarn of certain staple fibers from Malaysia, Pakistan, Thailand and Vietnam. The anti-dumping taxes currently in force still do not appear to be sufficient for the Turkish yarn market on the one hand according to the manmade yarn manufacturers and, on the other hand, China's WTO membership, China being Turkey's main competitor both in natural and manmade fibers, is a major issue when it comes to imposing new duties and also implementing the existing ones.

Critical €/US\$ exchange rates threaten manmade fiber manufacturers

Insufficient domestic capacity in producing the raw materials is another major hurdle faced by the Turkish manmade fiber industry. When we consider the cost structure of manmade fibers,

Development of export-imports of manmade fibers over the last 15 years in 1,000 US\$



In 2001 the trade balance was almost even.

Source: Ministry of Customs and Trade of Turkey

we clearly see that about 60-70% of the costs result from the raw materials. Here, manufacturers who managed to diversify their products are somehow considered to be a step ahead. Producing most of its specialty products based on DMT and starting with Px, SASA could be viewed as a perfect example here. Having a DMT capacity of 280,000 tons/year and a polymer capacity of 350,000 tons/year including PTA-based production, SASA stands out as the largest polyester fiber and yarn manufacturer in Turkey with 150,878 tons of polyester fiber and 4,077 tons of polyester yarn production in 2014.

However, the most common manmade fiber today – polyester – is mainly composed of purified terephthalic acid (PTA) and mono-ethylene glycol (MEG), which are domestically produced by PETKIM. However, PETKIM

has an annual production capacity of 89,000 tons of PTA and 70,000 tons of MEG respectively. In view of the fact that PTA is not only a raw material for polyester fibers, but is also used as a raw material for PET bottles, polyester resins and films for the packaging industry, PETKIM falls short in meeting the requirements of the polyester fiber manufacturers.

To give another example, whereas some acrylonitrile, the basic raw material of the acrylic fibers which are today used as an outstanding substitute for wool, is currently also manufactured by PETKIM, all the required vinyl acetate is imported. This obliges the manmade fiber industry to import a significant amount of chemicals, particularly from China. With this in mind, the recent €/US\$ exchange rates have become one of the major challenges that the sector is struggling to cope with.

The manufacturers, who principally import their raw materials in US\$, realize their exports particularly to the EU zone in €. The falling of the €/US\$ exchange rate to the lowest it has been for 10 years in the first week of March significantly increased the input costs and decreased the export revenues of the manufacturers accordingly.

Sales models with long payment targets appear to be major risks for most of the small and medium-sized enterprises within the Turkish textile industry, which particularly invest through bank loans. This also brings the risk of excessive and unstable growth at the same time. There are a remarkable number of companies in Turkey that keep carrying on the business through bills of exchange, which could likely become a significant risk once the tables are turned. Whereas sales models with long payment targets bring additional benefits for those companies with huge

capital stock, it brings the risk of bankruptcy for the companies dependent on bank loans to keep their business going.

Having lost a significant advantage to a certain extent with the currency exchange rates, Turkish manmade yarn manufacturers have to an extent conversely benefited from the decrease in the oil prizes. Brent crude oil per barrel that was traded at the levels of about 110 US\$ in May 2014 was being traded at about 60.5 US\$ levels in February this year. However, the sudden decreases in the raw materials in the sector and the nervousness caused by the prospect for further decreases resulted in an unexpected recession in the last quarter of 2014.

Negative impact of global framework conditions

With today's volatile economic platform in its neighboring countries in particular, where Turkey realizes significant amount of its textile exports, Turkey must not only ensure it diversifies its product range predominantly in the industrial textiles sector, it must also diversify its export markets. Above all Russia, which used to rank as Turkey's number one export market, dropped to second place with an about 25% decrease in 2014, mainly due to the business confidence and investment initiatives having fallen to the lowest level ever and domestic consumption and industrial production accordingly decreasing due to its crisis with Ukraine. All in all, this has resulted in a significant fall in the value of the ruble against major currencies.

Iraq became another critical export market, where alarm bells started ringing because of recent rising domestic conflict and ISIS seizing complete control of the northern part of the country. The ongoing civil war in Syria, the political crisis regarding the sharing of oil revenues and the bankruptcy of Greece

Turkey scores excellent points from the EU regarding commercial aspects such as flexibility, geographical proximity, language and culture, design and fashion compared to the major textile locations such as China, India, Pakistan, Bangladesh and Indonesia.

are some of the major concerns for the near future affecting not only the textile industry, but the whole manufacturing industry.

Meanwhile, China, which has a substantial impact on cotton prices, stopped cotton imports in order to decrease existing stocks and this has accordingly resulted in a fall in cotton prices. This somehow affected the entire textile industry not only in Turkey, but worldwide.

Turkey maintaining its competitiveness

However, the Turkish textile industry still maintains its competitiveness in many aspects today when current textile markets are considered. Turkey scores excellent points from the EU regarding commercial aspects such as flexibility, geographical proximity, language and culture, design and fashion compared to the major textile locations such as China, India, Pakistan, Bangladesh and Indonesia. Regarding industrial factors, such as raw material supply and modernization of the machinery, Turkey is almost even with China and a lot more competitive than the rest.

When general key factors are considered, whereas China only surpasses Turkey in accessing capital, Turkey excels in energy and transaction costs,

transport, lead times and infrastructure. The labor costs are the major handicap here. According to the latest labor cost comparison for the textile industry carried out by Werner International in 2011, Pakistan is the most competitive in this respect, followed by Vietnam and India. Turkey, with labor costs of around 4.50 US\$/h, was almost twice as expensive as China at around 2.10 US\$/h in 2011. However, this discrepancy has been closing in recent years, as labor costs in China are rising continuously and considerably.

Overall, Turkey has not only a location advantage for the EU, it also distinguishes itself from other competitors with a number of remarkable features. The textile and apparel industry is significant as one of the key industries in supporting the achievement of the target to increase Turkey's total exports to 500 billion US\$ by 2023, the year in which the Turkish Republic is celebrating its centenary. For this impressive milestone, the textile and apparel industries have set their targets at 20 billion US\$ and 50 billion US\$ respectively. Despite all the drawbacks and negative effects, the Turkish textile and apparel industries are progressing towards this amazing target with a step-by-step approach.

Thanks to the ongoing government stability since 2002, Turkey has succeeded in overcoming most of the barriers. Turkey will experience an important election in June 2015 that will determine the new government for the next 4 years. Provided the ongoing stability continues and the new government is able to succeed in preparing the long-awaited new constitution, market diversification is achieved, the continuously-observed development in the industrial textiles field continues and the roadmaps of this target are successfully implemented, these targets are definitely open and could be reached even before 2023. (yo)

For more than 40 years Oerlikon's segment Manmade Fibers is partner for the Turkish textile industry. BCF, filament, staple fiber and nonwovens producers are supported from representative offices and service stations in Istanbul, Bursa and Gaziantep.

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Bilge Otomasyon Sistemleri San. ve Tic. Ltd. Sti.
3. Organize Sanayi Bolgesi Sosyal Tesisler No. 12
A Sehitkamil
Gaziantep



Three questions for ...

Gülsan,

Mr Vedat Topcuoglu (left) and Mr Mustafa Topcuoglu



» You have been producing carpet yarns in Turkey since 1993 and you also export your yarns all over the world. Up to now, BCF yarn production in Turkey has focused on yarns made from polypropylene. For the past two years, you have also been manufacturing polyamide 6 and polyester yarns, making you Turkey's very first BCF PET yarn producer.

What do you consider to be the strengths and benefits of polyester? We produce carpet yarns with all three polymers and therefore we are more than familiar with their advantages and disadvantages. Polyamide 6 is a very expensive raw material and is predominantly used to make very high-quality carpets. In contrast, polypropylene is mainly used for mass-market products. Polyester, on the other hand, is far cheaper than polyamide 6 and offers similar features. Polyester carpets are very soft, yet durable; they feature vibrant and lasting colors and the yarns also enable post-production dyeing. Polyester yarns allow the production of superior carpets at much lower prices. In the USA, the trend for polyester yarns started a long time ago. As leading carpet yarn manufacturer, our target is to now introduce this trend to Turkey, Europe and the Middle East.

» Your plant mainly consists of Oerlikon Neumag systems. Why have you selected Oerlikon Neumag as a partner? Oerlikon Neumag is very experienced company in developing and manufacturing BCF carpet machinery. The systems deliver high-quality and very efficient products and offer environmentally-friendly production capabilities. We are always impressed with their excellent service and rapid spare parts replacements.



"Oerlikon Neumag is a very experienced company in developing and manufacturing BCF carpet machinery. The systems deliver high-quality and very efficient products and offer environmentally-friendly production capabilities."

» How do you envisage the BCF yarn business developing over the coming years, what is going to change and how will you react to the way the sector develops? Do you see yourself as a trendsetter? Gülsan was, in 1993, the first company to produce polypropylene BCF yarn in Turkey and we have established ourselves as a leading yarn producer thanks to our superior-quality yarns, top-level service and our innovation

activities, which we together further improve for the benefit of our customers. With our many years of experience and know-how, we want to ensure that polyester yarn becomes a widely-established product in Turkey, Europe and the Middle East. As a pioneering company that always introduces the very first products in Turkey as well as creating new markets, we will also be a leading player in the PET BCF market. (al)

Royal Hali,

Mr Cengiz Tasdemir



» You have been producing carpet yarns in Turkey since 2004, and you also export your yarns all over the world. BCF yarn production in Turkey has focused up to now on yarns made from polypropylene. For the past six months you have also been manufacturing yarns from polyester, making you one of Turkey's very first BCF PET yarn producers. What do you consider to be the strengths and benefits of polyester?

Polypropylene has indeed up to now been extremely popular in carpet yarn production and is used on a wide scale. However, the advantages of using polyester over polypropylene are self-evident. Firstly, as a carpet component polyester enjoys a longer lifecycle. This makes the carpets more robust and resistant to wear than polypropylene-based carpets.

Additionally, polyester yarns offer the option of printing or colouring. So you can produce them as natural white and then decide on a colour at a later stage. In contrast, polypropylene yarns can only be coloured in master batches during the actual production process. This entails much higher storage costs for yarn and carpet producers because they have to prestock large numbers of different colours. The quality of the polymer is far superior. Polyester provides products with enhanced shine and brilliancy, plus a better matt aspect. The prices of polyester and polypropylene are comparable. Raw polyester is easy to acquire in Gaziantep. The only disadvantage with polyester is the raw material's higher specific weight. However, this is only of consequence in the production of BCF yarns and is irrelevant for heatset and frieze yarns.



» Your plant mainly consists of Oerlikon Neumag systems. Why have you selected Oerlikon Neumag as a partner? Oerlikon Neumag technology is the best for manufacturing BCF yarns. It enables PP, PET and PA6 yarns to be produced on one system. In Turkey, Oerlikon Neumag systems are considered the Mercedes of BCF machines. The product development is excellent. The company is always bringing new products onto the market. Customers are directly informed about all new technologies that are coming out. The company itself as well as its regional sites always operate very professionally. If problems arise with systems, the Service department responds immediately to find a solution as quickly as possible. Spare parts are always readily available, due not least to the presence of a local Service location here in Gaziantep.

» How do you envisage the BCF yarn business developing over the coming years, what is going to change and how will you react to the way the sector develops? Do you see yourself as a trendsetter? We at Royal Hali are, like Oerlikon Neumag, a manufacturer that sets new trends and forges new developments in the carpet market. We export 95% of our yarns. The world's leading carpet producers are customers of ours. We are always looking to develop new and interesting products that are in both their and our interest. Due to the benefits offered by polyester as a raw material in carpet yarn production, we believe that over the next 5 years the market will switch over to this material. For this reason, our company has already invested in this production and, therefore, invested in the future. (al)

Three questions for ...

Aktif Tekstil,

Mr Hilmi Kaplama and Mr Ismail Akalin



» You have been producing carpet yarns in Turkey since 2011, and you also export your yarns all over the world. BCF yarn production in Turkey has focused up to now on yarns made from polypropylene. For the past six months you have also been manufacturing polyester yarns, making you one of Turkey's very first BCF PET yarn producers. What do you consider to be the strengths and benefits of polyester?

In light of the diversity currently prevalent in the carpet market, we believe that yarn must also move in this direction, so we decided to direct our investment into this area. We are convinced that the limitations in terms of the range of polypropylene yarns can be overcome by turning to polyester. Its robustness and easy handling gives polyester huge advantages when it comes to yarn production. What's more, carpets made from polyester can be cleaned easily, are not flammable and retain their shape for a long period. These are all benefits greatly prized by end customers.

"In order to survive in this market it is not only crucial to adapt to the changes that present themselves, you have to initiate these changes and drive them forward."

We are proud to have managed to get polyester, which is available in all textile sectors, into the carpet market.

» Your plant mainly consists of Oerlikon Neumag systems. Why have you selected Oerlikon Neumag as a partner? As a machine manufacturer for filament yarn production, Oerlikon Neumag is the top choice for all producers. After we took the decision to invest in yarn production, we carried out our project in collaboration with Oerlikon Neumag. And yet again this proved to be the right

decision as the project was executed without any problems whatsoever.

» How do you envisage the BCF yarn business developing over the coming years, what is going to change and how will you react to the way the sector develops? Do you see yourself as a trendsetter?

Turkey has been a leading player in the carpet sector for a long time. At Aktif Tekstil, we firmly believe that our country will also retain its position among the top BCF yarn producers for a long period to come. In order to survive in this market it is not only crucial to adapt to the changes that present themselves, you have to initiate these changes and drive them forward. It is precisely for these reasons, and in order to expand our product portfolio, that we also now produce yarn using polyester in addition to our polypropylene BCF yarn.

We are convinced that innovations will emerge over next few years. To keep pace with this progressive trend, we carry out ongoing comprehensive testing as part of our development activity. This ensures constant improvement in the quality of our yarns, and enables them to be produced faster and at lower cost. We are developing our production and processes all the time. Companies who fail to keep up with progress are doomed to failure. So we continually strive to take two steps forward every day and align our development activity accordingly. (al)

Talked to Fibers and Filaments: Hilmi Kaplama (left) and Ismail Akalin



Retrofits and modification kits for DTY machines

Efficiency + economy = high yarn quality

With the introduction of the eFK machine in 2008, Oerlikon Barmag introduced the modular machine concept allowing greater flexibility and selectivity of layout and components. With more than 2000 eFK machines since delivered, this population delivers performance all over the world for numerous applications and a wide variety of products and polymers.

With changing markets, the demand for greater flexibility or added functionality is growing. Markets with big machine populations and mainly commodity products focus on further optimization of processes to improve conversion cost and markets with smaller machine populations serving niche or specialty products require greater flexibility and added functionality. For the eFK and its predecessor, the FK6, Oerlikon Barmag has developed based on these requirements and the various generations of machines in operation solutions to enhance functionality, to increase flexibility and to improve operational cost through capacity increases or more efficient operation.

Efficiency and economy

Increasing efficiency and economy while maintaining consistently-high yarn quality is therefore no longer dependent on, or limited to, the age of the machines and components, but can be achieved by retrofitting or modification depending on the requirements. An example for increasing machine capacities is the machine extension kit for up to 12 sections. This kit allows the extension of existing 216- or 240-position machines to a maximum of 288 positions. Following the general development, a solution for up to 384 positions will be available in the future. The solution provides new drives and related e-cabinet combined with Oerlikon Barmag's narrow space layout, which can increase the capacity by minimum of 10% in the same space required by the current layout. In such cases, a machine with previously 216 positions would be extended to 240 positions without changing the machine pitch. More positions with optimized drives and supply will increase the throughput while optimizing the consumption per kg of yarn, hence improving the conversion costs. This kit is available for the FK6-1000 and eFK machine series.



Focus on quality

When looking for a superior process transparency and improving and controlling the yarn quality, yarn manufacturers can draw on UNITENS (TM)*, an online tension monitoring system, and the Oerlikon Barmag CreelManager. The basic functionality of the CreelManager system is monitoring and informing the transfer between POY bobbins. In combination with the online tension monitoring concept, this does not only allow to identify packages with splices or knots, but also to differentiate yarn break causes, identify probable reasons, improve transfer faults and monitor POY loading. Packages with splices are identified either by TouchPanel or PID-Box; in combination with this concept, online tension monitoring quality information is being added. Furthermore, DTY and POY can be linked with the scanning solution from Oerlikon Barmag, bad DTY packages due to bad POY can be identified and traced back to their origin. All this information combined in the POC (Plant Operation Center) software allows complete plant-wide overview, greater transparency and analysis to improve the production as part of your plant total quality system (TQM). (as)

*The term 'Unitens' is an internationally registered trademark exclusively owned by Saurer FibreVision Ltd.; Macclesfield, UK

Pumps require expert know-how

Spinning pumps are among the key elements in the complex Oerlikon Manmade Fibers spinning systems for manufacturing high-quality filament yarns. They ensure that the medium to be spun is evenly pushed through the spinnerets at a precisely-defined rate. Hence, gear metering pumps must in principle fulfill two tasks: firstly, they have to generate the required pressure for passing the melt through the nozzle and – secondly – they must feed the melt in a consistent flow in a low-pulsation manner.

In addition to the spinning pumps, the spin finish pumps carry out a further important function in the spinning system process. Shortly before take-up, they moisten the freshly-spun filaments

with spin finish liquid by means of a nozzle to preserve it and – depending on the subsequent application or further processing step – give them additional properties. The tiny conveying medium throughput volumes are a particular challenge for the manufacture of the pumps in terms of precision and attention to detail. With gear wheels that weigh no more than 1 gram, the pump appears to be as filigree as a movement of a clock and the work of the installer as delicate as that of a watchmaker. Ensuring that all pumps always reproducibly master their tasks with the same level of quality throughout the life of the respective machine requires regular pump servicing and maintenance provided by the Oerlikon Manmade Fibers Segment pump service. Only then is it possible

to maintain smooth systems operation over a long period of time, hence avoiding any loss of performance.

One of the most important concerns when it comes to pumps is to consistently improve on-site service and maintenance for customers. For this reason, trained Oerlikon Barmag employees at several locations across the globe provide pump servicing and maintenance in accordance with the superlative Oerlikon Barmag quality standards (see Infobox). These standards ensure that all pumps leaving the workshop are as good as brand-new ones. The malfunction causes are analyzed, original spare parts are installed and pumps are finally tested using a test stand.

What benefit do yarn manufacturers achieve from this?

For customers, this means that they have their repaired or serviced pumps returned with a new plant warranty after a short processing period of approximately four weeks including transport. Furthermore, they can be assured that technical innovations are directly integrated into the servicing and maintenance of the pumps. For better planning, the costs for labor are defined in advance, while original spare parts are offered at reduced prices. Hence, customers are able to manufacture yarns of constant quality – both now and in the future. Among others, for many years now the German company Dralon GmbH, which is based in Dormagen, has benefitted from the advantages of a maintenance contract with Oerlikon Barmag. The pumps that the market leader for acrylic fibers uses in its spinning lines are serviced at regular intervals by experts from Oerlikon Barmag on the basis of a service plan. The positive results and fast lead times were the main reasons why the



company opted for the maintenance contract. Dirk Berkenhaus, Head of Engineering with Dralon explained: “The consistently-high production quality and the optimized life of the pumps have convinced us that we made the right decision to go with the Oerlikon Barmag servicing and maintenance offerings.” (wa)

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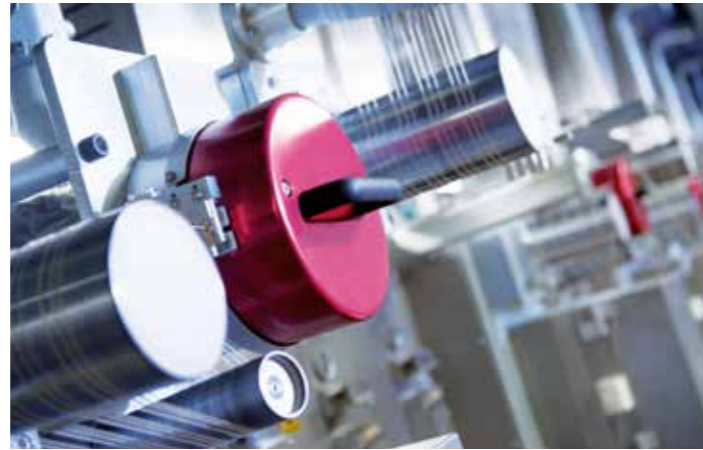
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Success with customized service solutions

“Always keeping an eye on customer benefits during development”

Systems modernization and retrofit solutions offer the advantage of state-of-the-art upgrades at relatively low cost. And there are also plenty of commercial arguments. Frequently, the upgraded facilities are considerably more energy efficient and productive. This saves money. To this end, modernization costs are frequently returned within the shortest period of time.



Fibers & Filaments spoke to Tilman Seidel (right), Head of Service Sales & Offerings, and Niels Herrmann, Head of Service Sales Oerlikon Neumag, about systems modernization options and their benefits.

» Mr. Seidel, the retrofitting and upgrade business is currently having a boom. What do you put this down to? We are currently experiencing something of a market normalization period; huge investments have been made in new systems over the past five years. The machine construction sector has always been somewhat cyclical, with the result that there is a natural settling of the market following such an extreme boom. The logical consequence is a stronger focus on ‘small’ solutions. How can manufacturers become major players again with small investments?

» And is this where our customer services division comes into play? Precisely. For all our new technological developments, we always retain a keen eye on existing machines and

systems. Can we also offer our innovations as a modernization package? What prerequisites do the system and the innovation have to fulfill in these cases to ensure that they are compatible? This is down to our understanding of partnership. We maintain long-term relationships with our customers. So we are therefore naturally very interested in looking after ‘our’ technologies within the market throughout their life and hence ensure that our customers secure excellent margins. Concretely, we consult our customers as to how they can modernize or reconfigure their existing systems to achieve greater efficiency and superior quality. Depending on the process and the systems in question, the solutions can be very customized. Which is why consultation is so important. There are very few ‘off-the-peg’ solutions.

» Mr. Seidel, you have just returned from Gaziantep in Turkey, where the RoTac³ – a new tangling unit for the BCF yarn process – was unveiled. This unit can also be retrofitted to existing systems. Is this worthwhile?

Absolutely. The RoTac³ saves up to 50% in tangle air consumption. This is quite an achievement against the backdrop of rising energy prices. BCF yarn manufacturers in Turkey and elsewhere are subject to tremendous pressure on their margins. So, a saving of this magnitude is most welcome and makes investing in the RoTac³ technology very interesting. Furthermore, our pilot system trials have shown that the RoTac³ produces more even knots than in the case of every solution to date. In addition to this, the number of knots and the strength of knots can be set independently of each other, a feature that is absolutely new! This results in visible superior yarn quality – which in turn has a positive impact on further processing and hence offers our customers another USP in a fiercely competitive market. This allows yarn producers to achieve higher yarn prices. One more reason to invest.

The RoTac³ saves up to 50% in tangle air consumption. This is quite an achievement against the backdrop of rising energy prices.

» Mr. Herrmann, which machines can be upgraded? And what is the return-on-investment (ROI) period? All S+ type BCF systems can be upgraded. To this end, Turkey alone is home to more than 300 positions.

The ROI depends on the specific systems owned by the respective BCF producers. Influencing factors include the respective process data, energy costs and benefits arising from further processing, which can all differ strongly depending on the region in question. In Turkey, for example, an ROI of approx. two years can be achieved for defined processes. Here, the new sales opportunities based on the absolutely unique technical and quality benefits already mentioned above cannot even be taken into consideration yet. So, most definitely worth considering.

Mr. Seidel, Mr. Herrmann, thank you for talking to us. (bey)

The car of the future will be wearing more textiles

Even today, the average car has around 30 kilograms of textiles, according to the German Textil research board of trustees. And this is a growing trend, as high-performance and intelligent fibers, yarns and compound materials are assuming an ever greater number of comfort, safety, acoustic and fuel-saving functions in the age of light-weight construction. Oerlikon Barmag is also driving this attractive future market – with high-end solutions for manufacturing quality industrial yarns.

The global market for industrial textiles is expanding considerably and automotive construction is the number one consumer. A Commerzbank study carried out in 2014 outlines some very interesting figures here: according to the information, the global market for industrial textiles (without nonwovens and composites) totaled US\$ 133 billion in 2012 with a production volume of 22 million tons and is set to rise to US\$ 160 billion by 2018. In 2010, with a slightly lower market volume than in 2012, automotive construction made up the lion's share of sales with 23 percent – considerably ahead of the second-placed, industrial solutions (17 percent).

It seems unlikely that these rankings have meanwhile changed significantly. Because the main drivers in the automobile industry are weight reduction

“We are also in the process of developing a new technology for the next generation of HMLS yarns with higher dimensional stability and tenacities in excess of 7.5 cN/dtex. This means even less yarn consumption and lighter tires, hence reducing both rolling resistance and fuel consumption”

and rising vehicle production – and it is here that the textile sector is developing ever more innovations. In Germany alone, around 50 medium-sized textile companies with 10,000 members of staff working as automobile sector suppliers are generating a turnover of more than € 4 billion, as outlined in a brochure published by the Textil research board of trustees in 2012. Today, car roofs, body parts and interior components such as claddings, switches and operating elements are being manufactured from industrial textiles. And the development laboratories are working on further, quite literally smart materials for the cars of the future (see text box, P. 27).

High-tech for seat belts

However, the research does not focus solely on new product ideas. Due to tremendous price and competition pressures within the automobile industry, there is a renewed concentration above all on the efficient production of such textiles or their economic contribution to automobile construction. Here, Oerlikon Barmag – the leader in the manufacture of spinning and texturing systems for manmade fibers – is able to bring diverse strengths to the table.

This starts with the production of yarns for safety belts. And this requires high-tech: the fabric construction should not solely restrain people inside vehicles during impact as they would be injured by the belts. Moreover, these fabrics should give, hence reducing or delaying the force exerted on the body. In the case of this principle, the individual fibers rub against each other and

therefore give in a defined manner. Belts that have been subjected to expansion must not be reused as they have by then lost their protective effect. “The manufacture of the belt yarn therefore has to comply with such challenging requirements as absence of fluffs, dyeability and perfect package build-up”, explains Ulrich Enders, Head of Development at Oerlikon Barmag in Remscheid.

This is made possible by machine concepts with up to 8 ends for the efficient production of high-tenacity,

fluff-free PET yarn with titers of up to 1,500 denier for safety belts. To this end, the special SFL (Single Filament Layer) technology guarantees an extremely gentle yarn path with even heating and drawing of the individual filaments using five pairs of heated godets. And the new WinFors winder also ensures an equally very even package build-up for these yarns. Its cam shaft traverse system is particularly suited for high yarn titers. And a high degree of transfer reliability and constant filament properties along the entire package are also achieved by means of the tried-and-tested co-current yarn catching system. “Tests in collaboration with a major belt manufacturer are able to confirm that our machine technology fulfills the high demands and requirements of this application. Within this partnership, we are also currently researching optimized solutions for tangling the individual filaments for improved further processing”, comments Stefan Becker, senior expert for industrial yarn application technology at Oerlikon Barmag.

More polyester for airbags

And the described machine technology is also perfect for finer airbag yarns made from polyamide or polyester. Here, the resistant polyester fiber is increasingly becoming an interesting alternative to polyamide, which has meanwhile become almost three times as expensive. “Currently, our customers continue to manufacture most airbag yarns from nylon. As a result of the ever growing diversity of airbag applications and also the ever larger systems – such as side, curtain and meanwhile also

Spinning systems from Oerlikon Barmag are involved to produce fibers and filaments for a variety of applications within in the automotive sector.

pedestrian airbags – the less expensive polyester is being increasingly focused on”, states Stefan Becker.

Against this background, cost-efficient manufacture is quite a challenge for producers. But this is where Oerlikon Barmag technologies can make an invaluable contribution. Here, the technology excels not just in terms of its high productivity and low energy consumption, but also with regards to its precision. To this end, threads used for airbags have particularly fine yarns as a

result of the special fabric construction and are therefore more sensitive to friction. The design of the system caters to this with a special yarn guide. All in all, the spinning machines fulfill all high quality standards for airbags, which – unlike virtually all other textile products in vehicle construction – have to ensure the greatest degree of safety for occupants. And all this without any loss of function in any climate anywhere in the world for the lifetime of the vehicle.

Tire cord yarns help save money

As one of just two manufacturers worldwide, Oerlikon Barmag also produces machines for HMLS (high-modulus low-shrinkage) yarns. These preliminary polyester products are primarily deployed for manufacturing tire cord. They are extremely tear-resistant, while nevertheless remaining highly elastic and stable in terms of their dimensions and temperature. This is important to ensure the tire also retains its shape when it is insufficiently inflated and heats up more due to the corresponding increased friction on road surfaces. The cord, a fabric made from twisted HMLS yarns, is united with the tire rubber at approximately 200 degrees Celsius. It lies between several layers of rubber and stabilizes the entire car tire on roads.

The EvoQuench HMLS system was developed for manufacturing such challenging HMLS yarns. It deploys the so-called radial quenching for the filaments, to ensure their extremely even cooling following spinning. This technology enables the manufacture of products with very high numbers of filaments and improves the quality of the individual threads. At the same time, a special air flow concept generates huge savings: the air consumption decreases by around 65 percent, while the energy consumption for the cooling system is reduced by at least half compared to conventional cross-flow quenching systems. And the Oerlikon

Barmag system also offers components with a high degree of effectiveness in other places, hence consuming all in all up to 20 percent less energy than comparable machines. Overall, this allows manufacturing costs to be considerably reduced. “We are also in the process of developing a new technology for the next generation of HMLS yarns with higher dimensional stability and tenacities in excess of 7.5 cN/dtex. This means even less yarn consumption and lighter tires, hence reducing both rolling resistance and fuel consumption”, states Andreas May.

And HMLS or HT (high-tenacity) yarns with higher tenacities and medium shrinkage are also used for fan belts and hoses. Furthermore, the HT concept is also deployed for the manufacture of yarns with low shrinkage values (up to 4 percent) for vehicle tarpaulins, with values of as little as 1.5 percent achievable with the X-SLS (super-low shrinkage) concept. Here, both concepts permit 6- to 8-end or 12- to 16-end systems.

Spun-dyed POY for seat upholstery and more

Furthermore, Oerlikon Barmag also supplies automobile POY yarn solutions. To this end, the proven dynamic mixing principle of the 3DD mixer enables textile yarns to be dyed during the manufacturing process. This spun-dyed POY is further processed into air-textured yarn and used in seat upholstery, roof linings and door claddings.

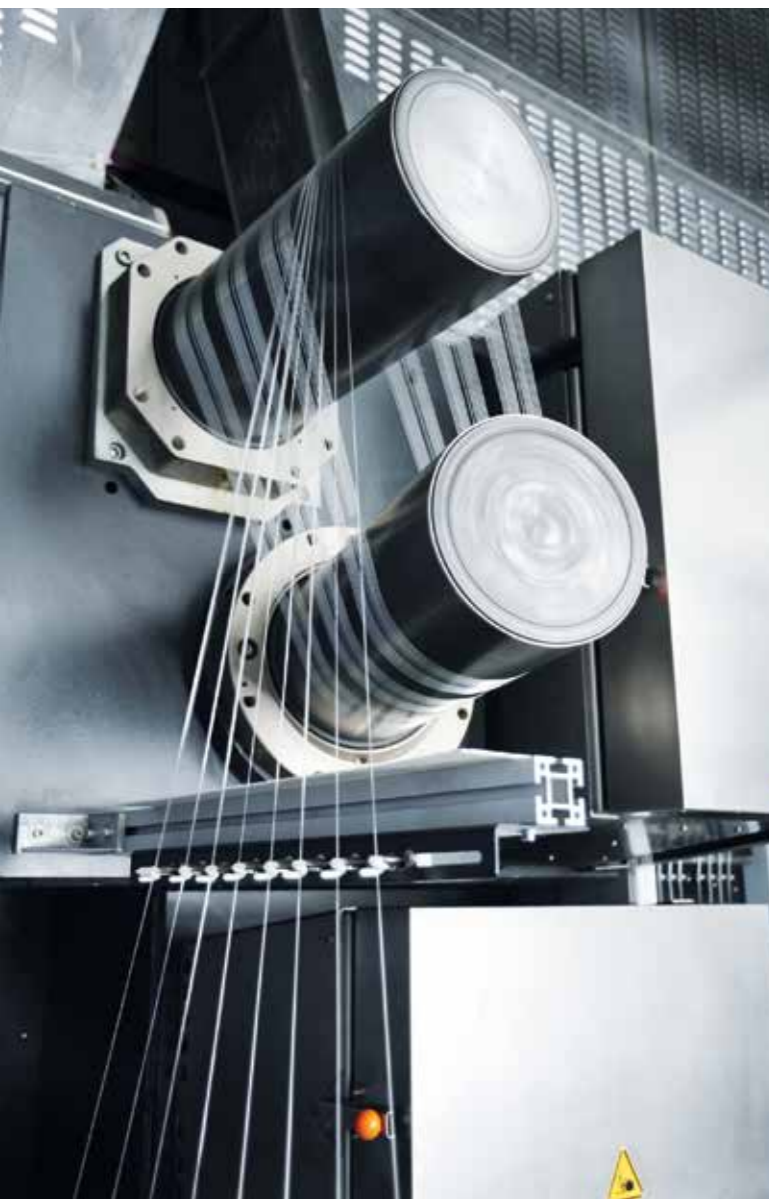
Here, the three-dimensional, highly-efficient mixing principle permits outstanding dispersive and distributive mixing of, for example, dye concentrates, fillers and additives that are fed into the polymer melt. Even small amounts and additives with vastly differing viscosities with a ratio of 1:100 can be homogeneously mixed and distributed. The mixer set-up can be adapted to



various applications, while important performance parameters, such as mixer speed, can be set to the desired process in a targeted manner. Hence, the patented system offers increased flexibility when manufacturing products of the very highest quality. (rei, tow)

Smart textiles act intelligently in vehicles

The textile future of the car has for many years not been restricted merely to carbon fiber-reinforced plastics (CRPs) for light-weight construction. Textile research laboratories are already working on smart textiles for vehicle interiors: invisible electrically-conductive fabrics for textile heating and cooling systems in seats; sensitive textile panels that can convert hand movements into gear shifting signals; illuminating LED yarns for pinpointed orientation; textile sensor systems for bio-monitoring drivers with the aim of identifying threatening conditions such as fatigue and stress. For sound insulation, researchers are working on replacing foam materials with new, recyclable compound materials comprising nonwovens, flocked textiles and membranes. Some ideas draw on nature: here, special fiber compound components can supposedly practically themselves ‘repair’ a tear in the component following impact – much in the same way as broken bones are able to heal themselves in the body.



Energy savings through innovative technologies

To remain competitive and participate in the market in the long term as a company in the textile industry today, it is important to take the current global trends on board. One vital trend that has increasingly become a focus over the past few years is the topic of energy savings. To, among other things, achieve sustainable economic growth, it is essential that companies look at all energy savings potentials. On top of this, rising energy costs also drive up operating costs and stand in the way of commercially efficient production. To counter this, the focus has to be on energy-saving machines and systems.

Oerlikon Manmade Fibers identified this trend early on and has been providing the market with energy-saving machine solutions for quite some time now. These have been constantly further developed in line with the four 'energy, economics, ergonomics and environment' e-save cornerstones. The WINGS technology has set a new benchmark for POY and FDY production in terms of sustainability. Over the past 20 years, the specific electricity consumption per ton of yarn has been

continually reduced. Compared to the systems constructed and supplied in 1994, the WINGS POY technology has achieved savings of more than 48% per manufactured ton of yarn and, in the case of WINGS FDY, in excess of 55%, which is considerably superior to the savings achieved by the industry standard. Furthermore, this technology is also able to increase the productivity of the system by up to 200%.

A recent analysis compares the now obsolete technologies with the new WINGS technology and shows that a considerable global energy savings potential could be achieved if these obsolete technologies were to be replaced with WINGS. Of interest here is the fact that obsolete technologies at Chinese manmade fiber spinning plants make up 30% of total energy consumption and CO₂ emissions, but merely 16% of total filament production. If all obsolete technologies worldwide were to be replaced with WINGS, this would reduce the specific average electricity consumption per ton by 58% in the case of WINGS FDY and by 48% in the case of WINGS POY. This means that 150,000 MWh of

energy could be saved and a reduction of 81,000 tons of CO₂ emissions achieved by replacing old technologies with new ones. That corresponds to the energy consumption of around 7,800 offices and the CO₂ emissions of approximately 40,000 cars a year. Half of the mentioned savings potentials can be achieved in China, the largest production site for manmade fibers and which is correspondingly of special significance for this country. Lowering the electricity consumption would reduce pressure on the supply system resulting from energy shortfalls during peak-demand periods. Furthermore, the energy savings would also have a positive impact on smog and environmental pollution in China, as fewer coal power plants would be required. However, the WINGS technology is not the only Oerlikon Manmade Fibers technology that makes energy savings during yarn production possible. For example, the EvoQuench quenching system saves energy for the required cooling air compared to cross-flow quenching systems.

And the 3DD mixer also makes a contribution towards more environmentally-

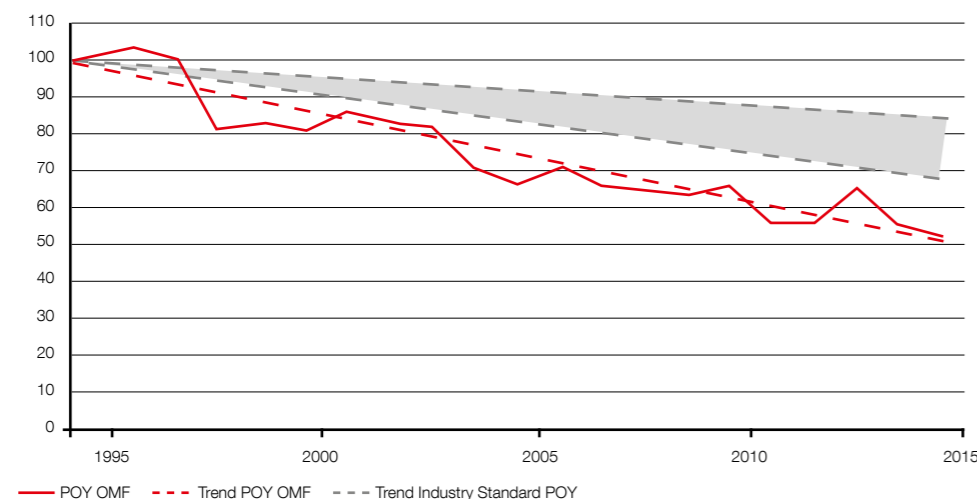


friendly filament production. Dyeing yarns has a hugely negative impact on the environment, caused by extreme water consumption and high chemical loads. The 3DD mixer offers a solution that permits the direct production of high-quality spun-dyed yarns, hence considerably reducing water consumption.

All this clearly shows that with innovative, intelligent technologies yarn manufacturers today can maintain and both increase their competitiveness and make a contribution towards improving the environment and better living conditions. (jh)

The WINGS technology has set a new benchmark for POY and FDY production in terms of sustainability.

WINGS-POY Electrical Consumption Index (1994 = 100) Consumption per ton of product



WINGS-FDY Electrical Consumption Index (1994 = 100) Consumption per ton of product



Typically German? No way!

With its impressive skyline of skyscrapers, Frankfurt does not need to shy away from comparisons with such cities as London, Paris, Milan and Madrid. Visitors to Frankfurt can expect to be treated to a breathtaking city! Frankfurt offers plenty of diversity within a compact space. Its tourist attractions are virtually all located in the city center or are mere minutes apart.

Need a 360° view of Frankfurt? With its 55 floors, the Main Tower rises 200 meters up into the sky, something that visitors to Frankfurt can convince themselves of by ascending its lofty heights. Today, the city is characterized by almost 100 skyscrapers, giving Frankfurt its nickname 'Mainhattan'. But there is something even taller to boast about: a particularly outstanding feature of the unique silhouette of the city is the 337.5-meter-high Europaturm, the second largest telecommunications tower of this kind in

Germany. If it were not for the antenna of the Berlin television tower – which provides an additional 30 meters – no other tower would be higher.

Frankfurt is also a city of contrasts. In the heart of the Old Town, 'Römerberg' square and the 'Römer' building form the main attractions for visitors to Frankfurt. With its architecture, the 'Römer' Town Hall is part of the oldest and most beautiful complex of buildings in the city. Residents of Frankfurt call their town hall square 'Römerberg', which was completely rebuilt in its original form following

the bombing of the Old Town in 1944. It is the perfect starting point for a city tour. You can see St. Bartholomäus imperial cathedral and Paulskirche church from here. The former hosted the coronations of ten monarchs over the centuries, while the latter was used as the parliamentary building in which the Frankfurt National Assembly (Frankfurter Nationalversammlung) sat, the very first democratically-elected

pan-German parliament. In addition to the banking quarter, the city of the River Main also offers impressive modern architecture at the MyZeil shopping center, which borders the popular Zeil shopping street.

The trading and banking city majors in the arts and culture

Although business is the engine of the city, the cultural offerings and the extensive landscaping also make Frankfurt a hugely-attractive place to live. Theaters, opera houses, galleries and museums, a zoo and parks – the diverse selection provides something for everybody.

The most famous son of the city is undoubtedly Johann Wolfgang von Goethe. Born in Frankfurt am Main on August 28, 1749, he lived in the house he was born in until the age of 26, located where the Goethe House and the Goethe Museum are now. The 17th Century building was rebuilt in its original form following its destruction during World War II. The furniture and fittings in the kitchen, living rooms and formal spaces correspond to those

typical of bourgeois living in the late-Baroque period and therefore offer an authentic insight into the life of the poet and philosopher.

The Old Opera House is a particular highlight. Each year, around 300 concerts and events attract countless visitors to the mahogany-clad halls. On most evenings throughout the year, national and international ensembles and soloists perform in the Great Hall. Family concerts, musicals, Jazz, Rock and Pop round off the high-end offerings. The museum embankment (Museumsufer) is home to numerous museums located on both sides of the river, including the Ständl Art Museum, the German Film Museum and the museums of architecture, communication and world heritage.

Frankfurt on foot

Those wishing to explore Frankfurt on foot should start at the bear and bull sculpture outside the Frankfurt stock exchange. This public space artwork is a depiction of the two leading symbols of the financial markets. The stock exchange decides exclusively on the whether the market is bull or bear, whereby the 'bull' represents a rising market and the 'bear' falling prices. The bull, with its majestic rampant

pose, is designed to spread the sense of change and optimism, with the bear and its head-down posture signifying the downwards trend of the stock exchange.

In contrast, those who would like to see real animals can visit Frankfurt Zoo, which is located in the city center and was established in 1858, making it one of the oldest zoological gardens in the world. Housed in open-air areas and in unique indoor enclosures, the zoo is home to a total of 500 different species and more than 4,500 animals. Those wanting to immerse themselves in even more nature can surround themselves with a whole range of fascinating flora from across the globe at the Palmengarten (Palm Garden). Between pathways and lawned areas punctuated with sun loungers, this plant paradise presents the most diverse topical gardens and greenhouses. The perfect stroll takes you from Römerberg square across the iron River Main bridge. Frankfurt's citizens financed this pedestrian bridge themselves back in 1868/69, because a single bridge was not sufficient to connect them to the southern part of the city.

Culinary delights

Frankfurters love their apple wine (cider): Stöfchen, Äppelwoi, Äppler – the national beverage has many German names. In summer, apple wine is a hugely-popular refreshment and mixed beverage, extremely tasty with its low average alcohol content of 5.5%. A high-quality apple wine tastes delicate and slightly sour. But please do not overindulge in the local tittle! Enjoyed in moderation or as a spritzer (diluted with mineral water), you will ensure your memories of Frankfurt are fond ones. (mn)



Heart of Frankfurt's old town: the Römerberg Square.

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