

fibers and filaments

the experts' magazine

issue 23 – january 2016

South East Asia stepping into the textile future

A portrait of Indonesia, Malaysia, Thailand and Vietnam

With the ASEAN states, the Southeast Asia textile region comprises an economic area of around 10% of the world's population.



Oerlikon Neumag focusses on polyester nonwovens

Technical nonwovens on the rise

Polyester is becoming increasingly significant in the spunbond sector.



"In conjunction with the WinTape take-up unit, the EvoTape system increases profitability of tape yarn production by up to 50% compared to conventional, standard systems."

Steffen Husfeldt
Head of Chemnitz Site
Oerlikon Barmag

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Boost operations with extreme productivity and minimum space requirements.

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In focus



Southeast Asia stepping into the textile future

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Editorial



Dear Customers, dear Readers,

The manmade fiber industry is also a growth engine outside of China and India. This has been impressively documented by the last two editions of our customer magazine, which focused on Turkey and the USA respectively.

The first edition of the New Year is dedicated to the South-east Asian textile region. With around 600 million people, this economic region makes up approximately 10% of the world's population. Just how different the individual countries are in terms of their textile and apparel industry is showcased by the portrait on Malaysia, Indonesia, Thailand and Vietnam.

With its comparably short history of manufacturing manmade fibers, Vietnam stands out from the other countries in South-east Asia: over the last 10 years, this country experienced the fastest growth within the region. Between 2005 and 2014, the production of yarns and fibers increased by an average of 30% per annum. The dynamic character of the Vietnamese textile industry is also reflected in the success of Jack Dang, founder and CEO of Century Vietnam, as demonstrated by our article on Page 30.

A further focus of this edition of Fibers & Filaments is on specialty yarns for industrial applications. We will be presenting new solutions for manufacturing airbag yarns. This area of application – for many years a polyamide yarns monopoly – is increasingly opening up to polyester yarns.

Also read about how polyester is making its mark on industrial applications for nonwovens technology. And be convinced by the WinTape mini, our new tape yarn winder for circular weaving tape production.

We are thrilled to be able to once again present you with another magazine with interesting manmade fiber topics. We hope you enjoy reading this edition of Fibers & Filaments.

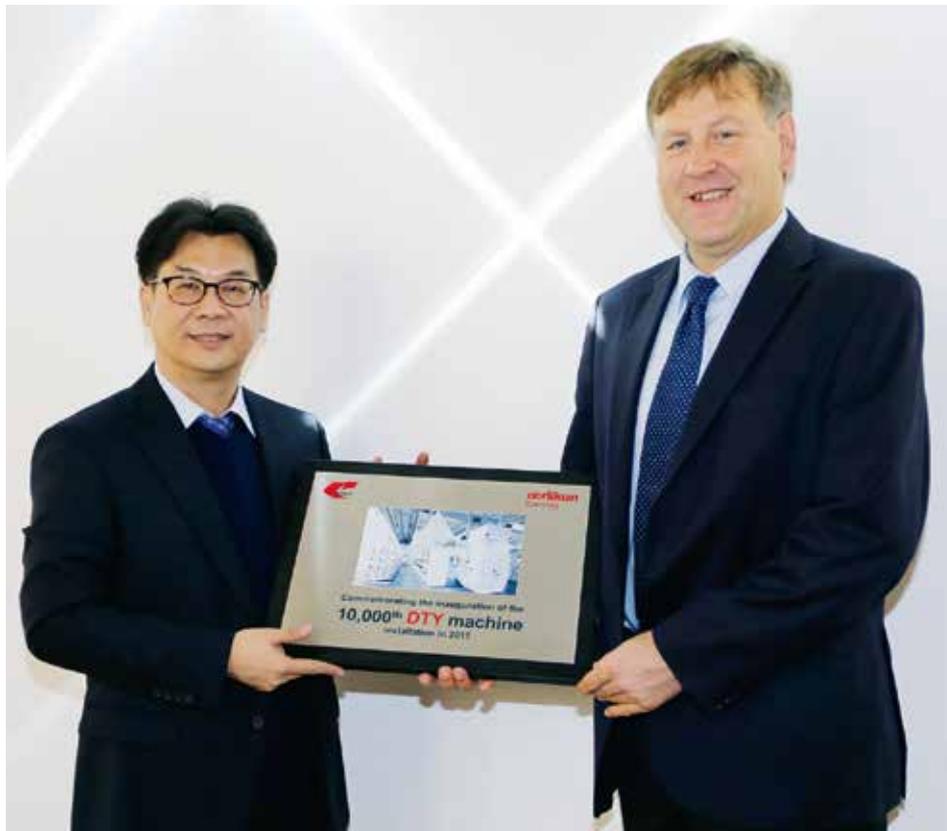
With best regards,

Georg Stausberg
CEO Oerlikon Manmade Fibers Segment

Visiting friends

On the way to the ITMA in Milan, Jack Dang, CEO of Century Synthetic Fiber Corporation, one of Vietnam's leading polyester yarn manufacturers, stopped over for a short visit at Oerlikon Barmag in Remscheid. This visit took place against the background of a longstanding successful partnership between both companies. Oerlikon Barmag has been assisting the Vietnamese enterprise for almost 15 years in expanding their production capacities and improving the quality of their yarns.

Oerlikon Barmag took advantage of this occasion to present a commemorative plaque to Jack Dang. This plaque marks the commissioning earlier this year of Century Synthetic Fiber's 10,000th texturing machine built by the technology leader. "The choice of the right supplier is a key factor for success", said Jack Dang. "We produce high-quality products with the help of Oerlikon Barmag's modern machines." Their success has proved him right. (wa)



Michael Korobczuk, Vice President Sales Segment Manmade Fibers, (right) congratulates Century's CEO Jack Dang on owning the 10,000th Oerlikon Barmag DTY machine.

Oerlikon Neumag sells its first Staple FORCE S 1000 for bicomponent fibers

At the end of 2015, Oerlikon Neumag signed a contract for the sale of the first Staple FORCE S 1000 for bicomponent fibers with an Asian customer. The system is designed to produce mono as well as bicomponent fibers and has an annual capacity of 5,000 tons. The order comprises a complete system – from the spinning unit through to the cutting equipment. The assembly and commissioning are planned to take place beginning of 2017. The fibers manufactured using the new system will be deployed in automotive applications.

To date, it was only possible to manufacture bicomponent fibers using a two-step staple fiber

process, as high take-up speeds are required for homogeneous and high-quality filament formation. Using the Staple FORCE S 1000, bicomponent fibers can now also be produced in a compact spinning process.

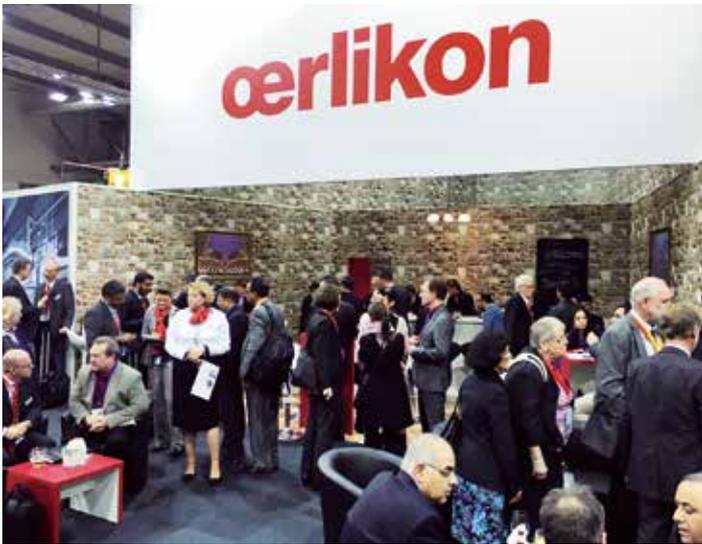
Compared to conventional, one-step processes, which operate with take-up speeds of approx. 80 meters per minute, the Staple FORCE S 1000 achieves a take-up speed of approx. 400 meters per minute. To this end, manufacturing for example PET/PE or PET/CoPET core-sheath fibers using a compact spinning process is no longer a problem. (che)



ITMA Milan exceeds all expectations
Correct perspective on the trade fair success

Every four years, the international textile machine manufacturing world meets up for a trade show in Europe. This time, just under 1,700 exhibitors descended on Milan to present 123,000 visitors from all over the world with their latest products, representing two records in one fell swoop!

“The sheer numbers of visitors attending our 650-m² trade fair stand on virtually every day of the trade fair exceeded all expectations”, explained André Wissenberg, Head of Marketing at Oerlikon’s Manmade Fibers segment. The company’s sales and service team conducted intensive customer discussions – both in the two virtual reality showrooms, filled to capacity throughout the trade fair, and in the exhibition, meeting and lounge areas.



The exhibited Manmade Fibers segment technologies were well received by customers and the trade press in equal measure.

“However, we have to put the success of the trade fair into perspective”, explains Wissenberg further. “A little more than a third of the overall market was present and even placed orders during the fair. Although, most of our customers from China were virtually absent as a result of the current reserved investment in the country.” Nevertheless: the impulses of the trade fair for the individual product lines was excellent. Spinning and texturing systems, staple fiber solutions, tape and monofilament applications along with polycondensation systems proved to be of great interest. (lka)

WINGS POY XS Series
WINGS technology now available as retrofit solution

The WINGS concept has been state-of-the-art in the area of yarn drawing and take-up for years. Now it has also become available to operators of older POY systems with SW, CW and ACW winders. With a new series, market leader Oerlikon is now expanding into the market for upgrades and modernisations to answer the high demand for WINGS retrofit solutions.

The new series of winders is called WINGS POY XS. Due to its extremely compact design, it can be used for vir-

tually any building concept. This stand-alone solution offers the usual benefits of a WINGS winder and is available for polyester as well as polyamide.

The series currently includes five models with 8 to 12 ends and chuck lengths of 1,200 to 1,800 mm. Despite its compact design, WINGS XS produces packages with a volume of up to 23.2 dm³. At the ITMA Milan, the eight-end winder version from the WINGS POY XS series with a stroke length of 170 mm has been exhibited. (bey)

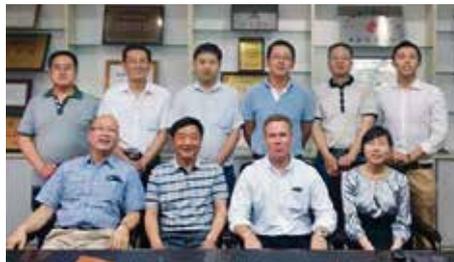


Its compact design makes the WINGS POY XS series the perfect retrofit solution.

First PET/CoPET bicomponent fiber spunbond line installed in China

Oerlikon Neumag has successfully assembled and commissioned its first bicomponent polyester multi beam spunbond nonwovens line for the production of high value technical fabrics. After a year in engineering and design, the installation, commissioning and acceptance were accomplished in record time. The line was officially turned over for production to Taipeng Nonwoven Company, Shandong Province this past November.

The production line combines round and “shaped” continuous filaments to form a tenacious, isotropic web structure used in the production of a diverse range of technical fabrics. It was not least thanks to the close and intensive collaboration between the Oerlikon Neumag staff in Neumünster, the colleagues on site in China and the customer that this unique spunbond system was successfully designed and implemented.



Great teamwork: the spunbond line was installed in record time.

The new line, with a capacity of approx. 7,500 tons per year, is just one of the future lines planned by Taipeng and represents a positive push forward for Oerlikon Neumag spunbond technologies in China. Taipeng selected the German company because of its position as one of the world’s leading suppliers of technologies and systems for manufacturing synthetic fibers and fabrics. (mcn)

Numerous technical discussions at the Domotex 2016

For all carpet and flooring manufacturers, the year always starts with a highlight – the Domotex in Hanover. This year, 1,441 companies from 59 countries – the highest number of exhibitors in years – presented their trade fair innovations.

The focus of the Oerlikon Neumag stand this year was on solutions for the sustainable manufacture of carpet yarns. The fact that this is also a major trend in BCF yarn production is shown by the exemplary success of the RoTac tangling unit.

RoTac³ convincing yarn manufacturers

Since the market launch of the RoTac³ as the new tangling unit for the BCF S+ system a year ago, just under 90% of all new sales have been equipped with the rotating tangling unit. And the business of retrofitting existing systems with the component is also operating well, comments Martin Rademacher, Oerlikon Neumag Sales Director: “For us, this is a sign that energy costs are playing an increasingly important role in BCF production.” (che)

Don & Low invest in Oerlikon Neumag meltblown line

In June 2016 Don & Low will start production and supply of meltblown nonwovens from their plant in Forfar, Scotland. This multi-million Euro investment into the latest Oerlikon Neumag technology brings further expansion of their product range and adds capability to offer benefits to new markets and applications by the introduction of new, innovative materials.

The line will help Don & Low to develop products with their customers across all markets and enable them to continue the focus on newer markets in filtration, automotive, medical and advanced composites.

The line has a web width of 160cm and utilises a range of polymers including polypropylene, polyethylene and thermoplastic polyurethane. With additional features including online air permeability, electrostatic charge capability, gap control calendar and multi-width slitting, Don & Low will produce meltblown and composites to exact customer requirements. (red)

The RoTac has been deployed as the tangling unit in the single-end Sytec One system since 2012. Meanwhile, virtually all Sytec One systems are sold with the RoTac tangling unit. To this end, the further development of the unit to create a three-end system was a logical consequence. (che)



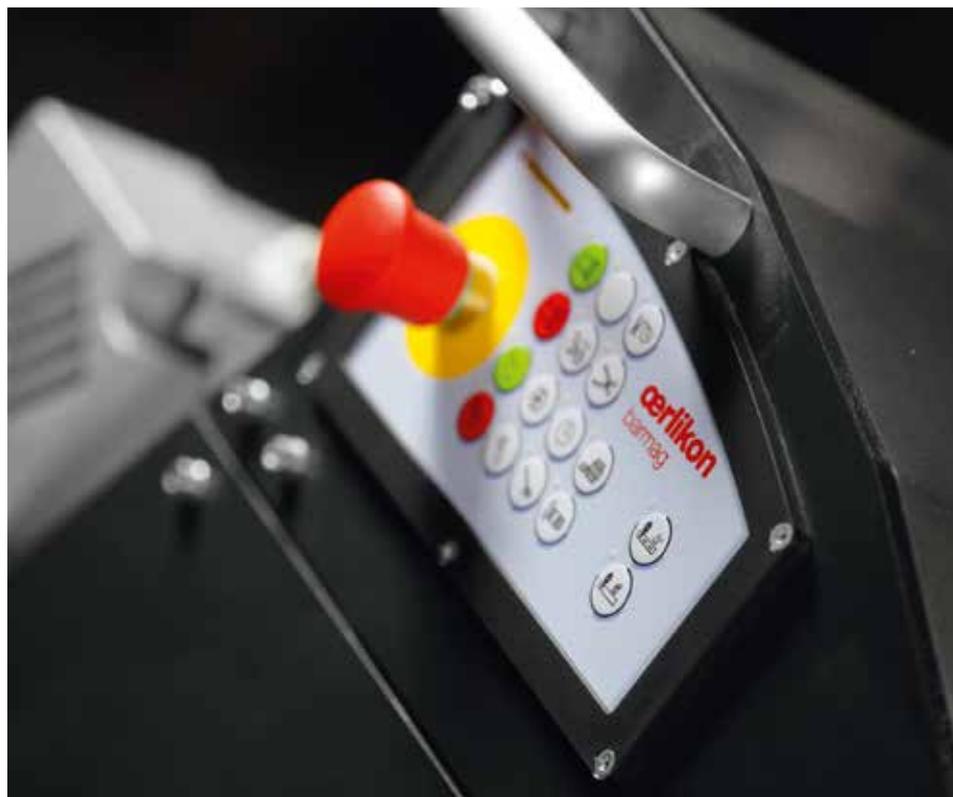


First WinFors winders sold to the US

The first WinFors-type winders have been sold to a well-known yarn manufacturer in the USA, with the delivery of the nine 8-end WinFors units with a 1200-mm stroke taking place in the second half of this year. The winders are part of a joint Oerlikon Barmag and Oerlikon Neumag project: the 8-position system manufactures various types of textile bicomponent yarns for the local and international markets.

The cam-shaft winder WinFors is the specialist for especially delicate yarns. The winder which premiered at last year's Techtextil trade fair in Frankfurt reveals its potential in particular when winding materials such as microfilaments, mother yarn, airbag yarns and seatbelt yarns. Deployable in the POY, FDY, industrial yarn and BCF processes, WinFors can be used as standard for polyamide, polyester and polypropylene polymers; other polymers – such as PVA, for example – are also not a problem.

Its flexibility not only makes the WinFors interesting to investors in new systems and equipment: this all-rounder is also perfect as a retrofit solution. 4-, 6- and 8-end and equipped with a 1200-mm chuck, WinFors can be fitted under virtually every older spinning system. Its huge process window and its versatility with regards to polymer processing and spinning processes make it the prudent solution for system modernization. (bey)



Events

Outlook Asia 2016

March 2-3, 2016, Singapore

www.edana.org

Domotex Asia 2016

March 22-24, 2016, Shanghai, China

www.domotexasiachinafloor.com

SAIGONTEX

March 30- April 2, 2016, Ho Chi Minh City, Vietnam

www.vfabric.com/sgtextile

GeoAmericas 2016

April 10-13, 2016, Miami, USA

www.geoamericas2016.org

PaintExpo

April 19-22, 2016, Karlsruhe, Germany

www.paintexpo.de

IDEA 2016 International Engineered Fabrics Conference and Exposition

May 2-5, 2016, Boston, USA

www.inda.org/idea16/

Techtextil North America

May 3-5, 2016, Atlanta, USA

www.techtextilna.com

ITM 2016

June 1-4, 2016, Istanbul, Turkey

www.itm2016.com

International Nonwovens Symposium

June 1-2, 2016, Warsaw, Poland

www.edana.org/education-events/conferences-and-symposia/event-detail/international-nonwovens-symposium-2016

Southeast Asia stepping into the textile future

With the ASEAN states, the Southeast Asia textile region comprises an economic area of around 600 million people, approximately 10% of the world's population. The export market is far greater and is expanding in many directions with the growing number of trade agreements. In the shadow of China, some countries within this region have secured themselves very promising starting positions for their textile and apparel industries in selected niches – and have set themselves ambitious targets. Our portrait reveals just how Indonesia, Malaysia, Thailand and Vietnam differ.

The local production of cotton, wool and silk has no commercial meaning in Indonesia, Malaysia, Thailand and Vietnam. If we add the manmade fiber production output of the countries in 2014, this totals 3.4 million tons (t) according to information supplied by The Fiber Year GmbH. This corresponds to a 5.4% share of global output. Nine years prior to this, when the Multi Fibre Arrangement (MFA) ended and quotas and import duties were abolished, this was 6.7% (2.6 million tons). Hence, share and volume have remained at moderate levels.

This picture changes slightly if we look at the individual fiber types. Indonesia is the six-largest polyester producer in the world, with Vietnam, Malaysia and Thailand taking seventh, eighth and ninth positions respectively. Furthermore, Indonesia doubled its production output of viscose fibers between 2005 and 2014 and has meanwhile become the third-largest manufacturer behind China and Western Europe. In turn, Vietnam is the world's four-largest producer of industrial yarn, despite the first equipment only being installed and commissioned in 2008.

Indonesia, Malaysia and Thailand have had polyamide industries for many years now. However, there have

been long-term declines in textile and industrial yarns registered in Indonesia. Malaysia has managed to extensively maintain its output of textile yarns. In Thailand, the production of textile filament yarns declined, while industrial yarn manufacture increased slightly. Vietnam has been producing polyamide since 2010/2011, with this industry developing dynamically in both textile and industrial yarns, albeit at low levels. Acrylic fibers are only manufactured in Thailand and the country is the fifth-largest producer in the world, although development has been stagnant since 2011 as in the case of the global market.

Between 2005 and 2014, all four countries were able to increase their textile and apparel exports. To this end, Vietnam overtook Indonesia, which initially topped the rankings: the smaller country increased exports more than fourfold to 24.8 billion US dollars (US\$) and is now ranked considerably ahead of the largest ASEAN country (12.4 billion US\$). Coming in third and fourth in the rankings are Thailand (8.0 billion US\$) and Malaysia (6.7 billion US\$).

However, the respective export surpluses developed differently and are in part of considerable national significance. New free trade agreements could create new, or shift, geopolitical centers. This particularly applies to the TPPA

(Trans-Pacific Partnership Agreement), which was signed in October 2015. The twelve member states – Australia, Brunei, Chile, Japan, Canada, Malaysia, Mexico, New Zealand, Peru, Singapore, the USA and Vietnam – will remove duties step-by-step over the next ten years. For Indonesia and Thailand, who have voiced interest in signing up despite not being members, this represents a considerable disadvantage for future deliveries to the NAFTA countries and Japan. To this end, the development and the objectives of the four textile regions are also quite divergent, something that becomes apparent in the following country portraits.

Indonesia: established player within the textile market

With exports increasing from 8.3 billion to 12.4 billion US dollars between 2005 and 2014 (source: the WTO), the Indonesian textile and apparel industry has firmly established itself among the top ten within the textile sector. According to information provided by Indonesia's Ministry of Industry, the country manufactures around 1.8% of



global demand for textiles and textile products. Important export countries include the USA (with a more than 30% share), Europe (16%), Japan (almost 10%), Turkey (5%) and the ASEAN countries (around 7%). Just under 60% of exports come from the apparel and shoes sectors, with more than 40% originating from upstream textiles (status: 2013). Here, filaments, yarns and wovens made from manmade fibers play a major role. In all, Indonesia manufactured, according to The Fiber Year GmbH, around 1.6 million tons of fibers and yarns in 2014, 94% of which were manmade fibers such as viscose, polyamide, polyester and polypropylene. Well-known manmade fiber producers include TIFICO, Asia Pacific Fiber (Texmaco), Mutu Gading Tekstil and Indorama. Virtually all cotton is imported.



Indonesia's textile history began with batik dyeing, created centuries ago in Indonesia above all on the island of Java, and has been awarded world heritage status by UNESCO.



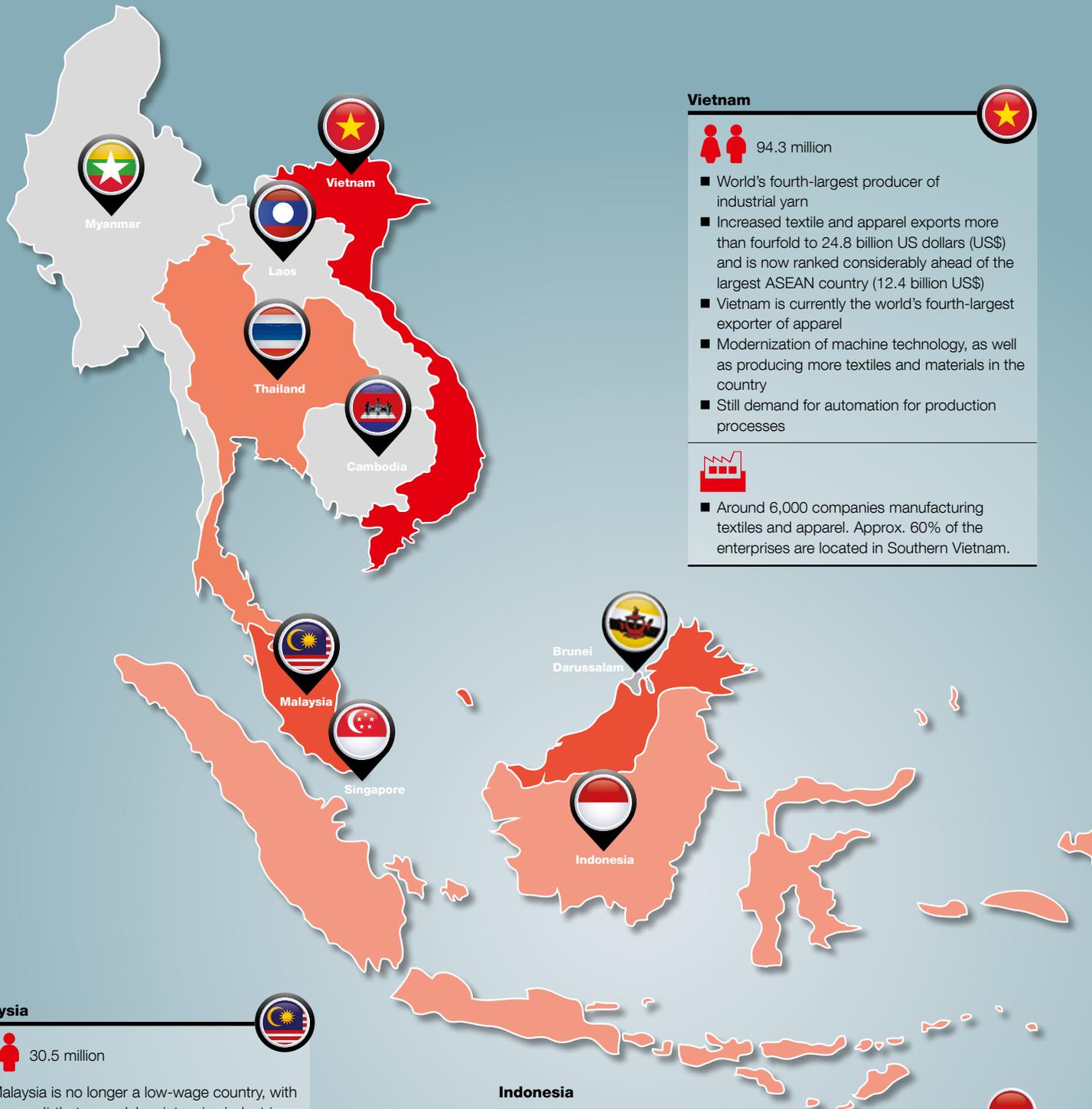
The fiber, textile and apparel industry is among the oldest and strategically most-important industries in Indonesia. However, its textile history began with batik dyeing, created centuries ago in Indonesia above all on the island of Java, and has been awarded world heritage status by UNESCO. The largest Southeast Asian country did not establish its apparel industry until the 1970s, just like many other Asian countries. The German-Indonesian Chamber of Industry and Commerce (AHK Indonesia) counts around 2,900 companies within the textiles and apparel sector. Most enterprises are concentrated in the Central Java province, with headquarters in the capital city, Jakarta.

Low labor costs and numerous correspondingly inexpensive workers are the decisive reasons for the country's development and the success, but not the only ones. Special state subsidies make the country attractive to foreign companies wishing to set up factories in Indonesia. Agreements between the trades unions and international customers or initiatives such as the Better

Work program of the International Labour Organization simultaneously ensure better working conditions and health and safety measures. The successive increases in the minimum wage are however a challenge. To this end, the minimum monthly wage in 2012 rose by up to 40% to between 80 and 160 US\$ for apparel workers. In 2013, growth again totaled around 18% on average, rising to 44% in Jakarta. Here, Indonesia is unable to compete with 'real' low-wage countries such as Myanmar, Bangladesh, Pakistan, Laos and Cambodia. However, even though some companies are relocating, the country does not need to fear a mass exodus according to the opinions of industry experts. Because there are still regions with low wage costs within the archipelago. With this in mind, many of the factories still manufacturing in Jakarta are expected to relocate to the provinces in western and central Java over the coming years.

High profit margins

Further favorable prerequisites speak for companies remaining, or establish-



Vietnam



94.3 million

- World's fourth-largest producer of industrial yarn
- Increased textile and apparel exports more than fourfold to 24.8 billion US dollars (US\$) and is now ranked considerably ahead of the largest ASEAN country (12.4 billion US\$)
- Vietnam is currently the world's fourth-largest exporter of apparel
- Modernization of machine technology, as well as producing more textiles and materials in the country
- Still demand for automation for production processes



- Around 6,000 companies manufacturing textiles and apparel. Approx. 60% of the enterprises are located in Southern Vietnam.

Malaysia



30.5 million

- Malaysia is no longer a low-wage country, with the result that many labor-intensive industries around the textiles, leather and footwear sectors have relocated to other countries and others will also follow
- Market experts believe it is important to invest in the further expansion of the downstream weaving and knitting processes for fibers and yarn capacities in order to be able to further process locally-manufactured fiber materials in Malaysia. This approach would also enable a step-by-step increase in apparel exports.



- More than 1,500 textile and apparel companies with around 40,000 employees, manufacturing both for the domestic market and export.

Indonesia



256 million

- Six-largest polyester producer in the world
- Become the third-largest manufacturer of viscose fibers behind China and Western Europe.
- Indonesia manufactured, according to The Fiber Year GmbH, around 1.6 million tons of fibers and yarns in 2014, 94% of which were manmade fibers such as viscose, polyamide, polyester and polypropylene.
- Reorientation of domestic manufacturers toward higher-end products
- Modernization is urgently required to be able to be successful against such low-wage competitors as Myanmar or Cambodia



- Around 2,900 companies within the textiles and apparel sector. Most enterprises are concentrated in the Central Java province, with headquarters in the capital city, Jakarta.

Thailand



68 million

- The hitherto low-wage mass production is to be replaced with higher-end, innovative and creative products.
- Thailand is able to support itself on competitive advantages including modern technology, along with qualified workers and an understanding of quality.
- German machines in demand, Thailand is home to considerable investment in semi-automated and fully-automated systems and equipment (for example, automatic cutters).



- More than 2,000 companies active in the apparel sector and a further 2,000 in the textile industry in 2013, including 82 registered apparel exporting companies



ing themselves, in Indonesia. Here, textile enterprises profit above all from the large domestic market and the young, growing population of 260 million with rising private consumption, which – according to forecasts supplied by Germany Trade & Invest (GTAI), the business development agency of the Federal Republic of Germany – is expected to generate 5% growth in real terms annually. Unlike in China, profit margins are also extremely high according to statements from most market players. In view of the meanwhile cooling economy, pressure is however building for companies focusing on

since the government cut energy tariffs as a result of falling oil prices. Known deficiencies still include old machines and equipment, which are still not of a generally competitive technological standard despite the introduction of a subsidy program. According to information supplied by the Indonesian industry ministry from 2011, around 4 million spinning, 200,000 weaving and 34,000 knitting machines that are more than 20 years old are in operation in Indonesia. Modernization is urgently required to be able to be successful against such low-wage competitors as Myanmar or Cambodia. Many, although

New free trade agreements could create new, or shift, geopolitical centers. This particularly applies to the TPPA (Trans-Pacific-Partnership Agreement), which was signed in October 2015.

their domestic markets. To this end, the Indonesian press reported on tens of thousands of jobs lost in the sector in 2015. Reasons for this are growing (cheap) imports, along with the volume of unofficial imports. Indonesia's textile imports grew by a factor of five between 2004 and 2014, while the corresponding exports merely almost doubled. To this end, the AHK claims that manmade fiber yarn and fabric imports, for instance, grew more strongly over the past five years than their exports, even though their absolute volumes remain considerably lower.

Modernization urgently required

There are several challenges: Indonesia lacks free trade agreements, such as those its competitors Malaysia and Vietnam have signed, or will sign, with the USA and other countries (through the TPPA) or with the EU. The textile exports are suffering in part as a result of long delivery times due to frequently considerable reloading activities at shipping ports. The industry has been dealing with increased energy prices

not all textile companies, are taking this path. To this end, textile machine imports in Indonesia totaled – according to the GTAI – 940 million US\$ in 2014. Primary suppliers of these machines are China and Japan, with Germany providing a (growing) share of 11%. The national Investment Coordinating Board of the Republic of Indonesia (BKPM) anticipates falling textile machine imports in 2015, with rising imports again in 2016.

2030: textiles are the largest export sector in Indonesia

According to current GTAI information, the Indonesian economy is currently experiencing a cooling, with double-digit falls in exports and imports in 2015 caused by low raw material and energy prices, among other factors. In 2016, foreign trade is however expected to increase again and the economy will improve. Positive economic impulse is required, as the Indonesian government has set itself very ambitious targets for the textile and apparel industry. To this end, the government hopes that

exports will increase from around 10 billion US\$ in 2009 to 54 billion US\$ in 2025. Over the same period, employment in the sector is supposed to increase from 1.4 million to 3.1 million. The state hopes that it will be able to secure itself a four to five percent share of the foreign demand for textiles. The government has joined forces with the Indonesian Textile Association (API) to draft a corresponding expansion roadmap. According to information from the AHK, textiles will be Indonesia's largest export sector in 2030.

According to market experts, there are opportunities in strengthening the domestic value chain with the fibers and wovens segments. To this end, the import of woven and knitted products could be reduced, followed by a coordinated expansion that the large domestic market could quite easily cope with. In Indonesia, the rising standard of living is demanding increased offerings of high-end textile fibers and yarns as well as branded apparel. The Global Business Guide Indonesia is above all supporting the reorientation of domestic manufacturers toward higher-end products, as it is particularly the foreign apparel brands that are flourishing within the country. There is also potential for industrial textiles or industrial fibers and nonwovens for corresponding ap-

plication markets such as the construction industry, the automotive sector and medicine. Today, Indonesian yarn manufacturers are producing specialty yarns such as bicomponent yarns, tire cord and yarns for fishing nets. All this shows that there is a development basis within Indonesia and that the country will continue to be a strong player within the textile sector.

Malaysia: strong with brands and raw materials

Malaysia's strength within the apparel industry stretches back to the 1980s. At the time, the country was establishing itself as a contract manufacturer of high-end branded apparel for Marks & Spencer, Tommy Hilfiger, Adidas, Nike all the way through to Ralph Lauren. Meanwhile, the industry has developed from trader and OEM manufacturer to become an internationally-oriented design and brand supplier along the entire value chain.

A wide ranges of materials is used – ranging from cotton and silk, synthetics such as polyester all the way through to spun fabrics and recycled materials. Most of these materials are manufactured by the local textile industry, which was established several decades ago with the arrival of the first weaving plant in the country. Today, the value chain



ranges from spinning, knitting and weaving through to dyeing, printing, screen printing through to embroidery. Malaysia has more than 1,500 textile and apparel companies with around 40,000 employees, manufacturing both for the domestic market and export.

Thanks to its strong petrochemical industry, with its substantial oil and gas reserves, Malaysia has the necessary raw materials to manufacture textile fibers. Some companies also specialize

Facts and figures

| 2015 | Indonesia | Malaysia | Thailand | Vietnam |
|------------------------|---------------------|---------------------|---------------------|---------------------|
| Population | 256.0 million | 30.5 million | 68.0 million | 94.3 million |
| Pop. growth up to 2020 | 0.8% (AAGR) | 1.4% (AAGR) | 0.3% (AAGR) | 0.9% (AAGR) |
| GDP per capita in US\$ | 3,511 | 10,654 | 5,612 | 2,233 |
| Income category | Lower middle income | Upper middle income | Upper middle income | Lower middle income |
| Inflation | 4.6% | 2.4% | -0.3% | 2.5% |
| Unemployment rate | 5.8% | 3.0% | 0.8% | 2.5% |

Source: International Monetary Fund, World Bank Group and the U.S. Census Bureau



Malaysia has established itself as an internationally-oriented design and brand supplier along the entire value chain.

However, the importance of the industry has declined in terms of the national sector export rankings for Malaysia: here, textiles and apparel came in in ninth position even back in 2011, accounting for 2.3% of exports. In 2014, they constituted merely 1.4% of total exports.

Textile impetus thanks to the TPPA?

Status and performance of the textile and apparel industry could however improve once again: according to a PricewaterhouseCoopers (PwC) study, the textile industry is the biggest winner among the sectors within the country when looking at the exports within the context of the TPPA, which started in October 2015. The initiated step-by-step removal of duties will also benefit apparel manufacturers in Malaysia, as 59% of their exports went to TPPA countries in 2014. To this end, just 10% lower duties for the main customer the USA, for example, would generate annual savings of 190 million Malaysian ringgit (RM/44.68 million US\$), estimates PwC. Further major customers are TPPA member Japan, along with Turkey, Indonesia and China. Countries such as Vietnam, South Korea and Germany are also emerging customers.

in the production of industrial textiles such as geotextiles for the construction and heavy industries or in flame-retardant, antibacterial, breathable and oil- or water-resistant materials. In terms of yarn trading, Malaysia is a net importer, as more than 50% of local filament yarn production is destined for export. When it comes to the fiber trade, the country has been a net exporter since 2009, predominantly importing raw cotton and exporting manmade staple fibers. Between 2005

and 2014, the production of manmade fibers grew from 0.4 to 0.5 million tons and hence by 4.3% annually on average.

Over the same period, Malaysian exports of textiles and apparel grew from 3.8 billion US\$ auf 6.7 billion US\$, according to WTO information – whereby export surpluses rose from 2.6 billion US\$ to 4.1 billion US\$ and made up 16% of the country's entire balance of trade in 2014.

Manmade Fiber production 2005 - 2014 (change in % AAGR/average annual growth rate)

| | Indonesia | Malaysia | Thailand | Vietnam |
|--|---------------------------------|---------------------------------|---------------------------------|------------------------------------|
| Production of fibers/yarns 2005 - 2014 | 1.2 to 1.5 million tons (+2.9%) | 0.4 to 0.5 million tons (+4.3%) | 1.1 to 0.7 million tons (-4.1%) | 0.06 to 0.66 million tons (+30.6%) |
| Of which MMF (2014) | 94% | 96% | 88% | 63% |
| MMF types (2014) | Viscose, PA, PES, PP | PA, PES | Viscose, acrylics, PA, PES, PP | PA, PES, PP |
| Production of nonwovens (2014) | 0.1 million tons | 0.1 million tons | 0.2 million tons | ./. |

Source: The Fiber Year GmbH, Switzerland

However, there are also other general conditions that are impeding the further development of the textile and apparel industry. Malaysia is no longer a low-wage country, with the result that many labor-intensive industries around the textiles, leather and footwear sectors have relocated to other countries and others will also follow. The minimum monthly wage has been fixed in western Malaysia since early 2013 and stands at 900 RM (around 212 US\$) – plus social security contributions and supplements, making total wages considerably higher. Even though Malaysia's gross domestic product (GDP) in 2013 lagged behind Indonesia, with its six times larger population, and Thailand, which is twice the size – when it came to per-capita income, it exceeded its neighbors by a factor of between two and almost three. With the exception of Singapore and Brunei, Malaysia

conditions, such as political, economic and social stability, well-developed infrastructures, favorable cost factors, attractive investment incentives, good English, a large reservoir of qualified workers and a high degree of legal certainty. The trend towards greater automation and energy efficiency is cutting a swathe – on a moderate level – through all sectors and offers incentives for companies in the country's 2015 budget as well.

However, the current macroeconomic framework also harbors challenges. According to information provided by the GTAI, GDP and economic growth are expected to weaken in 2015 and 2016, with foreign trade stagnating and consumption growth weakening. Following peak levels of approved investment in 2014 – with products purchased rising from 0.8 billion RM

Malaysia offers favorable general conditions, such as political, economic and social stability, well-developed infrastructures, favorable cost factors, attractive investment incentives, good English, a large reservoir of qualified workers and a high degree of legal certainty.

has the by far highest levels of income and affluence. At 14 kg, the textile per-capita consumption also exceeds that of Thailand (12 kg) and Indonesia (6 kg). However, the Malaysian market is – with its 30 million inhabitants – relatively limited.

En-route to becoming a high-wage country

Overall, Malaysia offers good development prospects: over the past few years, the Malaysian economy has grown consistently and soundly and has received impetus from being a member of the ASEAN Economic Community (AEC) and a signatory of trade agreements such as the TPPA. The country offers favorable general

to 1.2 billion RM in the textiles and textile products sector – the government anticipates a fall in investment in 2015. There are slight falls in imports and exports expected for 2015 and weak growth for both in 2016. Machine import growth is anticipated to merely be low single-digit. A stabilizing factor remains private consumption.

Nevertheless, Malaysia not only wants to grow by 5 to 6% per year by 2020, it also wants to develop into a high-wage country and take the low-income groups with it at the same time. This ambitious target was once again highlighted in the five-year plan submitted in May 2015. However, the objectives are not truly supported by a flourishing



apparel industry. Market experts believe it is important to invest in the further expansion of the downstream weaving and knitting processes for fibers and yarn capacities in order to be able to further process locally-manufactured fiber materials in Malaysia. This approach would also enable a step-by-step increase in apparel exports.

Thailand: fashion and design champion by 2030

Thailand's textile and apparel sector is changing: at the end of 2011, the severe flooding destroyed many factories, causing billions in damages. In the first five months of 2012, textile exports fell by 18.8% to 1.5 billion US\$ and apparel exports by 9.2% to 1.05 billion



US\$, according to information provided by the GTAI, but mainly as a result of the existing EU crisis. In early 2013, the government also introduced a legal minimum daily wage of 300 baht (approximately 8.20 US\$), which resulted in a direct increase in wages equivalent to around 40%. Consequently, some of the mass production was relocated to far more favorable neighboring countries such as Cambodia, Laos, Myanmar and Vietnam.

These deep measures triggered a rethinking and a reorientation, accompanied by a politically-supported long-term plan. These include a switch to more demanding textile fibers, along with a stronger orientation on new

fashion trends. The hitherto low-wage mass production is to be replaced with higher-end, innovative and creative products. The government is in the process of intensifying its activities with export loans, promoting vocational training and recruiting specialists from all over the world with a focus on state-of-the-art technologies. And private industry is cooperating: to this end, the German-Thailand Chamber of Commerce (AHK Thailand) states that twelve companies have joined forces to create the Thai Tex Trend partnership, with the aim of triggering innovation within the textile industry and introducing modern weaving, knitting, dyeing, finishing and printing technologies. And two joint venture partners are also

making their mark: the Thai petrochemical group Indorama Ventures (IVL), one of the world's leading manufacturers of polyester fibers, and the Japanese synthetic fiber specialist Toyobo together acquired the German manmade fiber producer PHP Fibers, which the two partners hope will lead to synergies for industrial fibers within the European, North American and Asian markets.

With its change in structure, Thailand is able to support itself on competitive advantages including modern technology, along with qualified workers and an understanding of quality. And Thailand also covers the entire textile value chain – from raw materials (with the exception of cotton) all the way through to end products. According to The Fiber Year GmbH, of the around 0.8 million tons of fiber and yarn produced in 2014, 88% are manmade fibers, also including viscose, polyamide and polypropylene. However, capacities and production volumes along the value chain are falling as a result of companies relocating to other countries. To this end, decreasing export surpluses have been registered, although the country remains a net exporter within the fiber and yarn sector.

German machines in demand

With the exception of a few large foreign fiber producers, further processing is predominantly characterized by domestic small and medium-sized enterprises. According to information provided by the AHK Thailand, there were more than 2,000 companies active in the apparel sector and a further 2,000 in the textile industry in 2013, including 82 registered apparel exporting companies. Customers include Nike, Puma and Fruit of the Loom, among others. Textile industry centers are, on the one hand, located in the north of Thailand with its rich raw material reserves and, on the other hand, Bangkok and its surrounding areas and the east of the country.

Up to 1 million employees were active within Thailand's apparel industry in 2013, of which around 200,000 were employed in the textile industry. These sectors therefore represent the second-largest employer within Thailand's manufacturing industry, with the apparel industry making up 12.3% of gross domestic product. The range of products manufactured in Thailand is considered to be very diverse, with an extremely comprehensive production palette – ranging from high-tech synthetic goods, wool and fashion products all the way through to bed sheets, sleep wear and industrial textiles.

Modern technologies, particularly from Germany, form an important component of the reorientation of the sector. To this end, German imports of tex-

tile and leather processing machines accounted, according to information from the GTAI, for an above-average share of 25% (96 million US\$) in 2014. AHK information verifies that Thailand is home to considerable investment in semi-automated and fully-automated systems and equipment (for example, automatic cutters).

Following the crisis years of 2011 and 2012, exports stabilized again in 2013 and – according to the GTAI – reached 7.5 billion US\$ for textiles and 2.5 billion US\$ for apparel. In the same year, production of textile fibers and wovens rose by 14% and by 7% in the case of apparel. The most important export markets were the ASEAN countries (21%), Japan (11%), the USA (16%) and the EU (15%). In terms of apparel,

the dominant customers remain the USA (35%) and the EU (25%), considerably ahead of Japan (11%) and the ASEAN region (5%). The import of textiles and apparel fell by 3.2% to 4.8 billion US\$ in 2013, mainly due to a decrease in imports of yarn, fibers, wovens and other textile products predominantly from Australia, Brazil, Turkey and Asia. In contrast, imports of apparel, predominantly from China, rose. With the emergence of the ASEAN Economic Community in 2015, the country hopes to be able to tap into new markets.

Lack of workers

In addition to prospects, there are also challenges relating to the country's competitiveness within the international market. To this end, the lack of workers

Investment in and the installation of new machines and systems helps increasing productivity and raising the level of quality.



could result in bottlenecks. Furthermore, there is also increasing recruitment competition from other sectors such as tourism in view of the low rate of unemployment of 0.8%.

However, the economic situation reveals a tentative upturn. Following falls in exports and imports in 2015, the National Economic and Social Development Board (NESDB) forecasts gross domestic product (GDP) growth of between 3 and 4 percent for 2016. And the government is also looking optimistically into the future, with the

Thailand Textile Institute (THTI) preparing a long-term plan to transform the country into a fashion and textile design leader by 2030. The country's position as the regional center for fashion and textile trading is to be consolidated by 2016. The second phase sees Thailand developing into a center of product design and globally-leading brands by 2021. In the third phase, the country will strive towards becoming the world market leader in fashion and textile design by 2030 by integrating its own contemporary culture into the sector. In addition to this long-term plan, it

sized, companies manufacture textiles and apparel, employing around 2.5 million people. The economic center is southern Vietnam, where around 60% of textile and apparel companies are located. About half of the 2,000 state-owned, private and foreign factories for off-the-peg apparel can be found in Ho Chi Minh City and surroundings, with a third in the capital Hanoi, 15 percent in Da Nang and the rest in other cities and regions. According to the delegation of German Business in Vietnam (AHK Vietnam), the sector is, based on exports, meanwhile the second most important goods category after communications equipment and devices. A fast development: Vietnam managed to establish its entire ready-to-wear sector in just 15 years – thanks to reacting swiftly and flexibly to new orders and conditions, along with extensive government measures.

In Thailand the lack of workers could result in bottlenecks. Furthermore, there is also increasing recruitment competition from other sectors such as tourism in view of the low rate of unemployment of 0.8%.

may be attractive to focus investment on capital-intensive spinning facilities, to then have the materials further processed in neighboring countries. Final processing and finishing in terms of product design and branding could then be carried out in Thailand again. However, the fact that creativity and innovation are necessary despite all the planning is showcased by a series of interesting, high value-added textile niche markets. The THTI lists examples of these: bullet-proof vests, nanotechnology shirts and bed sheets, fire-resistant couch covers and mosquito-resistant clothing for monks.

Vietnam: a flawless 'Tiger'

Vietnam is currently the world's fourth-largest exporter of apparel and increased its exports of textiles and apparel more than ten-fold to 24.8 billion US\$ between 2005 and 2014. In 2015, the country strove towards double-digit growth in exports to 28 billion US\$, states the GTAI. With this, the country is ahead of Indonesia, Malaysia and Thailand. According to the Vitas industry association, around 6,000, predominantly small and medium-

These include switching from a centralized planned economy to an open market economy, as well as memberships in numerous trade regions and agreements such as the Association of Southeast Asian Nations (ASEAN), the Asean-China Free Trade Area (ACFTA) and the World Trade Organization (WTO). Signing up to the TPPA is opening up extensive trade opportunities for the country. For the Vietnamese apparel sector, this means – for instance – the removal of the 17.2 percent duties on exports to the USA, the country's most important customer. It is believed that this will lead to a doubling in US exports within the textile and apparel sector. And the members Canada, Japan and Australia are – in addition to South Korea – among the traditional customers of manufactured goods. Here, Vietnam is benefiting from the fact that many customers are looking for alternatives to China and Bangladesh. The pending enforcement of the free trade agreement between Vietnam and the EU (with Germany and the United Kingdom as the primary



importers) is expected to be followed by an intensification of trade. In addition to this, Russia and the Middle East are developing as new markets for the apparel sector.

This expansive export trade is fundamentally down to foreign companies manufacturing in Vietnam. Since 2014, companies are increasingly investing in the country and foreign direct investment (FDI) is growing. Vietnam was able to register a plus of 8.4 percent compared to 2014 between January and September 2015 alone, with total investment coming in at 9.7 billion US\$ – a trend that is expected to continue according to the GTAI. These investments are above all targeted at labor-intensive factories, also those in the textile and apparel industry. According to information from the AHK, 660 million US\$ were invested in a textile factory of a Turkish enterprise to manufacture in-

dustrial fibers in the Dong Nai province, for instance, with a further 274 million US\$ being spent on a textile factory for manufacturing cotton and synthetic fibers, built in the Binh Duong province by a Taiwanese company.

Vietnam offers good conditions for projects of this kind. To this end, wages are about two-thirds below those in China, with the minimum wage in major cities 145 US\$, although this is expected to rise by around 12 percent in 2016. However, wages in low-wage countries such as Bangladesh, Cambodia, Laos and Myanmar remain considerably lower, which may slow down the relocation of apparel factories to Vietnam. But this industrious country is attracting investment with ever better arguments – such as motivated workers, good working conditions with, for example, regulating working hours and overtime, social security contributions,

continued pay in the event of illness and also paid vacation, employment protection and maternity leave. Making an important contribution here is the Better Work program of the International Labour Organisation, which has led to greater occupational safety and a reduction in costly accidents at participating companies. These improved conditions are bearing fruit: companies from Hong Kong, China, South Korea and other countries are building new textile and apparel factories in Vietnam or are relocating to Vietnam.

Increasing automation

However, the country still needs to simultaneously master several challenges. Above all, these include the modernization of machine technology, as well as producing more textiles and materials within the country, also with a view to complying with the local content stipulations of the free trade agree-



Vietnam managed to establish its entire ready-to-wear sector in just 15 years – thanks to reacting swiftly and flexibly to new orders and conditions, along with extensive government measures.

ments. Around 90% of export revenues are – according to information from the GTAI – still generated from apparel (in 2013). In accordance with AHK information, a total of 70% of textile activities are focused on sewing and 23% on spinning and weaving. The reason for this is the long-standing tradition of so-called cutting and sewing businesses in Vietnam, which have not been concentrating on large-scale spinning and weaving for very long. In contrast, textiles are still not being manufactured in sufficient quantities. Although Vietnam has – according to The Fiber Year GmbH – increased its production of manmade fibers from around 66,000 tons in 2005 to 660,000 tons in 2014, a ten-fold increase, net imports of manmade fibers and filaments however have simultaneously also increased, with a similar trend in downstream weaving and knitting. Against this background, the GTAI reports of 70% of all apparel materials being imported, predominantly from China.

To be able to offer demanding customers rising quality standards, there are plans to establish a domestic supply industry and to expand the textile value chain. According to information provided by the GTAI, this is the objective above all of state-owned company Vinatex (Viet Nam National Textile and Garment Group), the largest Vietnamese apparel manufacturer. Corresponding projects are underway particularly in central Vietnam, where labor costs are even lower than in the economic hub of southern Vietnam. According to reports from Vinatex, the company launched around 45 investment projects worth around 239 million US\$ in the first six months of 2013. Within this context, 14 new plants alone will produce yarns and fibers. In March 2015, Vinatex announced the 53.3 million US\$ (1.14 trillion dong) construction of a 20-hectare textile and apparel complex in the Quang Nam province, which also includes a fiber manufacturing facility

Making an important contribution here is the Better Work program of the International Labour Organisation, which has led to greater occupational safety and a reduction in costly accidents at participating companies.

(with an annual 4,600-ton capacity), a textile factory with a dyeing plant (5,000 tons per annum) and an apparel factory for knitwear including a waste water treatment plant. To support the domestic industry, Vinatex is planning to invest around 440 million US\$ (9.4 trillion dong) in textile and apparel projects (above all, weaving and dyeing plants) as well as in infrastructure before 2017.

In the meantime, domestic added value is successively rising, according to GTAI reports. There is also – following the manufacture of hitherto simple products – a trend towards higher-end items of apparel and the acceptance of smaller orders. However, there is still demand for automation for production processes. To this end, it has for some time been evident that investment in, and the installation of, new machines and systems is gaining significance – aimed at increasing productivity and raising the level of quality. Furthermore, small companies are deploying used machines, whose import – unlike in China – Vietnam has never prohibited, which has resulted in a considerable shift away from China and in particular from Taiwan and Korea. In addition to this, it is also reported that the subsidiaries of foreign companies are also securing themselves new and used German machines. As a result of growing reverse integration within Vietnam's textile and apparel industry, the market opportunities for high-end German machines should increase, estimates the AHK Vietnam. With regards to Vietnam, catching up in terms of automation will undoubtedly take a while, as will the

urgently required (further) qualification of employees, which the government is supporting by investing in education.

Fifth-largest textile and apparel manufacturer by 2020

Despite all these challenges, market experts believe that the small, powerful country will see positive development. Over the past few years, Vietnam has succeeded in maintaining macroeconomic conditions with low inflation, supported by globally-falling oil prices and continually-accelerating economic growth. Its expansive foreign trade based on free trade agreements, rising consumption (a plus of 6.3% in 2015, according to Deutsche Bank) as a result of the young population (average age: 29 years) and increasingly intensive activities in the real estate and construction sectors can by all means be interpreted as signs of a national upturn. Among other things, the government is supporting this development with initiatives for promoting foreign direct investment, reforms of institutions and administration, controls on inflation, macroeconomic stabilization and sustained growth.

Furthermore, Vietnam is planning to become one of the five largest textile and apparel manufacturing countries in the world by 2020. Until then, exports are supposed to reach 20 to 22 billion US\$. Furthermore, the vision also sees self-manufacturing rise to 70% (2015: 55%) by 2030. In line with a striking image of Asia in the 1980s, we can say: the tiger about to pounce. (tho, ae)

Andreas W. Engelhardt is the founder and general manager of The Fiber Year GmbH. The company was established at the end of 2010 with a view to provide international expertise, knowledge, analyses, strategy consulting and customized solutions to the international textile industry.



THE FIBER YEAR
CONSULTING

Oerlikon Neumag focusses on polyester nonwovens

Polyester, a raw material with numerous possibilities, interesting fiber parameters and extraordinary characteristics especially for the application in technical nonwoven products, is becoming increasingly significant in the spunbond sector.

Nonwovens which are produced directly from polymer chips, today already represent nearly 50% of all applied nonwovens and the percentage is clearly growing. The largest percentage is nowadays applied in hygienic, medical and wipe products – the so-called disposables. However, spunbonded fabrics and meltblown are also becoming more and more significant in technical applications. Based on their technical and economical advantages, they frequently substitute carded nonwoven material. This trend, which has already been implemented with hygienic nonwovens, can presently clearly be observed with the so-called durables.

With nonwovens which, for example, are used for home construction, the percentage of spunbonded fabrics, meltblown and the combination thereof, is presently above 80%. Also already more than 50% of filter nonwovens are being produced directly from chips. With nonwovens for geotextile applications only about 35% of meltspun nonwovens are used, just to name three large application areas.

Whereas today, with hygienic nonwovens, mainly polypropylene is the basic material applied, polyester and other polymers, such as PLA or also bico materials are increasingly being used. As the world market price for PP is now higher than that for PET, and this development will probably continue, the trend for all applications is to use polyester as raw material.

Apart from the raw material price, a significant driver on the technical application sector is the increasing orientation of the construction industry towards topics such as sustainability, thermal protection, energy consumption and (sound) insulation together with all the corresponding legal directives.

Polyester nonwovens fulfil the high demands on tenacity, thermal resistance and function often with a low material application and without additives. Like functional clothing, even thin layers of nonwovens can protect against cooling and only absorb minimum moisture. They, for example, easily adapt to roof constructions,



can readily and quickly be used as insulation, replace plaster in façade systems or bridge over cracks and serve as footstep sound insulation. They are a good alternative to foam, glass or mineral wool in redevelopment work and new constructions, especially considering that these do not always have the necessary flexibility for an optimal sealing. Last but not least, the nonwovens are resistant against environmental impacts and are, to a great extent, recyclable.

As a machine and plant engineering and manufacturing company, Oerlikon Neumag has decades of experience in processing polymers to fibers. The worldwide largest percentage of staple fibers and carpet yarn fibers are today produced on Oerlikon Neumag plants. This spinning competence has successfully been transferred to the spunbond technology, so that now, economical and also flexible processes from chips to the finished nonwoven roll can be supplied.

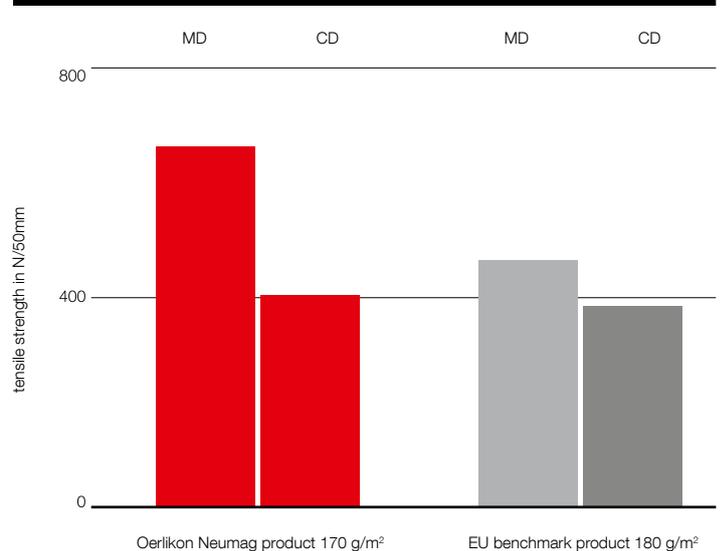
With the Oerlikon Neumag spunbond technology, high spinning speeds are possible enabling the production of high-tenacity filaments and PET filament nonwovens with an extremely low shrinkage. A permanently stable spinning process, the new energy-efficient filament drawing and optimized filament deposition onto the forming-wire, guarantee highest plant efficiency with lowest waste rates and maximum nonwoven quality.

With technical applications, the web strength is very crucial. The filaments need to have a very high tensile strength and often also allow a high elongation. As the raw material price during spunbond production accounts for about 75 – 85% of the production costs, the high technical demands must be attained with the lowest possible web-weight and optimized raw material usage. Benchmark comparisons with EU products common on the market result in the fact that with a comparable web-weight, higher web strengths can be attained with the Oerlikon Neumag spunbond technology.

Conversely this means that the necessary strengths can be attained at lower web-weights. Trials have resulted in the fact that this alone saves more than 5% on raw material.

Improved strength at lower basis weight (Benchmark example)

Bitumen roofing substrate

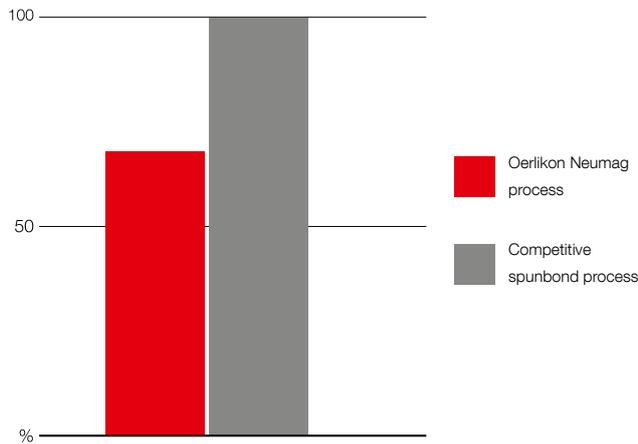


Low operating costs play an important role with investment decisions for a modern spunbond plant. Besides the commodity prices, the energy expenses are the second largest cost factor of the operating costs. Oerlikon Neumag has made extensive developments especially in the spinning area for reducing the specific energy consumption. An improvement of nearly 20% less energy consumption – just for the spinning section – has been attained with the new generation of Oerlikon Neumag spunbond plants. In comparison to classic PET spunbond processes, the reduction of the energy consumption totals about 30%.

Further cost drivers are personnel expenses as well as waste rate, downtimes and maintenance costs. Overall it could be proven that,



Bitumen roofing substrate production



in comparison to a classical PET spunbond plant, the sole conversion costs are 20% less, partially even more than 30% less for the manufacturer.

Through the consequent focussing on technical applications for their spunbond technology, Oerlikon Neumag has established comprehensive process know-how for all the processes including the necessary inline processing steps and can therefore now offer their customers appropriate production solutions for geotextiles, bitumen roofing substrates and roofing underlayments.

However other technical products such as carpet backing or filter media can also be profitably produced with this technology. The substantially expanded application pilot plant in Neumünster with many alternative bonding technologies including high-speed needling, is available for demonstrations and customer trials as well as for further product and process developments. (che, imm, pku)

This article has been published in AVR 5-15, pages 46-50.

Airbag yarns – polyester on the rise

Front airbags, side airbags, knee airbags, seat upholstery airbags, rear seat airbags, rear end airbags and belt airbags – anybody using cars or flying, riding a motorcycle or even a bicycle today is protected by means protective devices. The airbag has been on the rise ever since the American President Lyndon B. Johnson explained in the 1960s: “We can no longer tolerate unsafe automobiles!”. Since then, the technology has been constantly further developed and improved.

For many years, nylon was the chosen material from which airbags were made. Over the past few years, the share of airbags being manufactured from polyester yarns has gradually increased – not least as a result of the force majeure declarations for polyamide 6.6 issued by several major producers.

Greater safety as a result of more airbags

The demand for airbag yarns is constantly rising due to the global increase in the number of cars and

the consistent further development of safety technology. In the United States alone, growth is expected to be 40% by 2020 compared to 2011.

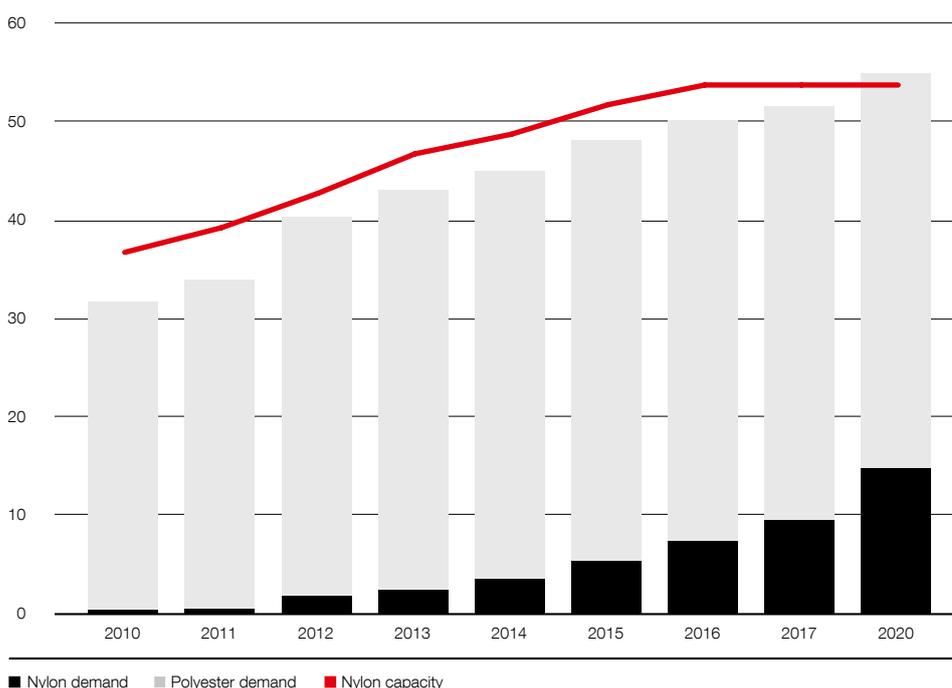
The by far largest exporter of nylon yarn is China, which supplied the world market with around 91,200 tons of nylon yarn in 2014. China is followed by Japan, with less than half China's volume and trailing far behind in third place is Taiwan, which was nevertheless able to increase exports of the yarn by 74 percent in 2014. The largest importers are Thailand, South Korea, China and Taiwan.

The US American market is stable, whereby its market for nylon yarns is being squeezed by the slowly rising share of polyester. There were initially several test runs with the alternative material, followed by a longer wait-and-see phase. From 2015/2016, several new models are to be equipped with more polyester airbags. Whereas the share in 2014 was still around 3,500 tons per year, the demand is expected to increase to up to 14,500 tons per year by 2020.

The European airbag market has a scope of around 32,000 tons per year. This market is very clearly dominated by nylon (PA6.6). The polyester yarn market share lies at just 2,000 tons per year (status: 2012). Even if vehicle sales in Europe stagnate, growth is nevertheless expected in the airbag market: on the one hand due to the larger number of vehicles being equipped with airbags and, on the other hand, as a result of the greater number of airbags in each car.

Airbag yarn capacity by North American supplier

in 1,000 tons



Never change a winning team?

Manufacturing airbags requires high-performance materials that absorb mechanical energy and withstand high mechanical loads and can also be used at increased temperatures. Polyamide 6.6 fulfills all these demands. Until today, the majority of airbags is manufactured from this material. The fact that polyester has to date been unable to make its mark within the sector is down to tradition, among other things. As in many sectors of industry, the

motto 'never change a winning team' also applies here. However, due to the fact that the number of airbags in a single vehicle is rising, the price factor is playing an increasingly important role. Compared to polyamide, polyester is considerably cheaper, but loses some of its raw material price advantage during the production chain.

New findings are opening up new possibilities

In the past, polyester was deemed unsuitable for airbags, as it has poorer heat and moisture resistances, two properties that are essential for airbags due to the fact that they have to function and be durable in all regions of the world and under the most diverse conditions.

In general, airbag yarns must be able to retain at least 85 percent of their tensile strength even after several thousands of hours in warm and in humid conditions.

New developments and research have shown that polymers should have industrial yarn qualities in order to fulfill the requirements of airbag materials.

On the safe side with Oerlikon systems

With the Oerlikon Barmag systems, manufacturers are perfectly equipped for both materials. The differing flow behaviors of the raw materials polyester and polyamide 6.6 only require adjustments to the spinning system when configuring an airbag yarn machine. Here, it is primarily about the highly distinctive melt viscosities. The yarn cooling system and draw unit are not affected.

The spinning plant components of the Oerlikon Barmag systems are designed



installations for evening the air flow profile.

The first systems in China are already in operation. State-of-the-art polyester airbag yarn installations have been successfully operating in North America since the spring of 2015.

The development continues

Even though polyester in airbag yarns remains far behind that of polyamide, manufacturers are looking optimistically towards the future. Various airbag producers are promoting the dynamic development and are working on systems that will retain the cost advantages of polyester in modular production. Here, airbag yarn systems from Oerlikon Barmag offer superlative prerequisites. The interest in polyester at least is expected to provide yarn manufacturers with remarkable growth in the future. (may, sbu)

for the polyester-relevant special requirements – for example, melt viscosity and filtration, along with downstream production processes. They have round spin packs with 3LA filtration and function using a forced sealing principle. The cross-flow quenching system for cooling is equipped with



The demand of airbag yarns is constantly rising.

WinTape and WinTape mini open up new possibilities

Automatic tape yarn winder WinTape heads for success

Since being launched two years ago, the automatic tape yarn winder WinTape with its nearly 2,000 installed positions has become firmly established in the market. The automatic precision winder for tape yarns is particularly convincing in terms of its process window, efficiency and investment costs.

Thanks to the fully automatic doffing, WinTape needs fewer operators. This is also due to the two parking positions for full packages as well as a magazine for four empty tubes. As a result, WinTape can run for up to 24 hours without an operator, for example in the case of tape production for carpet backing. With a winding speed of up to 800 m/min and a denier range of 270 to 3,000 dtex WinTape covers a wide process window.

WinTape mini for circularly woven yarns

The advantages of WinTape are now also available for the production of sacks and big bags. With WinTape mini an automatic tape yarn winder is entering the market that was specifically designed for the production of tape



The WinTape mini has been designed especially for the production of tapes for circular weaving processes.

yarns intended for circular weaving processes. With a winding speed of 800 m/min and a denier range of 400

to 2,500 dtex this mini is huge. Combine the WinTape mini with the EvoTape 800 extrusion line for best results.



The economic way of tape yarn production: The automatic WinTape winder can run for up to 24 hours without operator at speeds of up to 800 m/min.

The perfect pair: EvoTape and WinTape

In combination with the EvoTape extrusion line, WinTape unfolds its full potential. Up to 25% less energy consumption, about 20% fewer operators needed, no waste during bobbin transfer in tape production without preparation through immediate recycling – these are just some of the advantages this perfectly compatible pair provides.

EvoTape is available in the following configurations: carpet backing, geotextiles and baler twines. Possible end uses are warp and weft yarns for carpet backing, yarns for artificial turf, geo and agrotextiles, ropes, baler twines, sewing thread, tarpaulins, cable fillers and even jute substitutes such as woven carpets or coffee sacks. (bey)

Capacity for industrial yarns expanded

Brilen invests in Europe

Brilen SA, manmade polyester industrial yarn producer, has completed its extensive project by successfully commissioning the third expansion stage with plant builder Oerlikon Barmag. With this, the European market leader in polyester industrial yarns has increased its total capacity to 15,000 tons per year.

Over the last two years, the European market leader for PES industrial yarns has invested in three new spinning plants. Brilen is able to offer a wide range of polyester industrial yarn types to the market at a very high quality and based on fast and reliable service.

One of its new spinning lines is primarily focused on manufacturing SLS yarns for tarpaulins, tents and banners; another spinning line is predominantly dedicated to seat belt yarn production, with the final, third line being able to produce extremely high-quality yarns for geotextile applications.

Thanks to its continuous investment in the state-of the art Oerlikon Barmag technologies, Brilen has become probably the most reliable supplier with a long-term project program focused in Europe. The trendsetter, which belongs to the private Samca Group, manufactures exclusively in Barbastro located in the North of Spain. For years, the company has been relying on the engineering competence and technology from Remscheid when it comes to its innovative quality yarns. "From experience, we achieve

100% performance with Oerlikon Barmag facilities. This was confirmed again by our last project", explains General Manager José Antonio Rodríguez, talking about his decision to purchase. In particular, the energy-efficient e-save certified plant concepts from Remscheid lend Brilen's yarn production a significant competitive edge.

The flexibility of the tailor-made plant concept was another factor. On three individual lines, three different or similar products can be produced at the same time with highly-efficient eight-end technology.

Complete process from a single source

Brilen is vertically integrated to be able to influence the quality of its yarns: the spinning plant is supplied with first-class raw material as a result of its own PET chips production with a capacity of 250,000 tons per year.

But the collaboration between the Spanish industrial yarn specialist and Oerlikon Barmag goes even further: both companies, as well as Nurel (Brilen's sister company and manufacturer of textile polyamide yarns), are also collaborating closely on R&D. (bey)



Brilen's yarns find their application in technical products such as tarpaulins, tents, seat belts or geotextiles, to name but a few.

Artificial turf market coming back to life

The artificial turf industry has been experiencing an upturn for a short while now. Artificial lawns made from polyethylene fibers (PE) or polypropylene fibers (PP) are becoming increasingly popular not only in sports, but also in gardening and landscaping and the leisure and homes sectors.

The history of artificial turf goes back as far as the 1960s, when the first sports facilities were equipped with synthetic fibers made from polyamide – which looked and felt more like thick carpeting at the time. The sector has radically changed since then. And the fact that artificial turf has been criticized for causing friction and impact burns is – according to manufacturers – a thing of the past. Due to the huge technological progress made over the past few years, not only have the material properties of artificial turf improved significantly, the appearance and texture have become increasingly like those of natural grass.

Particularly the durability and mechanical robustness of synthetic grass makes it hugely attractive for many applications. One of the most important features for the sports sector is the fact that artificial grass can be used all year round without any quality compromises virtually, regardless of the climatic and geographic conditions. And it is this benefit that is now also being exploited in the leisure and homes sectors. To this end, artificial turf can today be found in many hotel complexes, golf courses and front gardens, for example.

Add to this the fact that artificial turf requires less care and maintenance than natural grass. The weave comprising synthetic fibers does not need to be watered, cut or fertilized, which in the long term makes it a less expensive and more environmentally-friendly alternative to natural lawn. Watering lawns plays a huge role particularly in North America, with many regions plagued by ongoing drought. For this reason, some communities are prom-



Tape and monofilament yarns for the production of artificial turf are produced on machines and systems manufactured at Oerlikon Barmag's Chemnitz site.



ising public facilities and residents discounts or cash payments if they replace their natural lawns with artificial turf. To this end, the US registered growth within the artificial turf industry amounting to 25% in 2015, while the figure was around 15% in Europe. Similar growth is expected for the coming year as well, whereby the landscaping sector is believed to harbor great development potential. (brh)



Open for opportunity

A good choice made easy

Ever since spinning and weaving were first mechanized in the 18th century, the yarn and textile industries have been in technological and geographical flux, spreading from one corner of the world to the other. Flourishing businesses in textiles ushered in the industrial revolution in countries as far apart as the United Kingdom, the United States and China.

Today, these twin industries are expanding rapidly in Southeast Asia, providing entrepreneurial and job opportunities alike, and spreading prosperity to companies and countries who demonstrate that they can compete successfully on the world market.

Envisioned a future and built a company

As a yarn trader in Vietnam in the 1990s, Dang Trieu Hoa – known to many internationally as Jack Dang – saw Taiwanese and Chinese polyester manufacturers triumph on international markets. “By the turn of the century,”



Century's CEO Jack Dang (right), here with Sales Director André Steingäß, is happy with the extended capacities.

Dang says, “I realized that my native Vietnam could serve as a natural new setting to support similar success stories.”

Determined that his story should be one of them, Dang established the Century Synthetic Fiber Corporation (now a publicly held company of which he is CEO) to produce polyester filament for the budding Vietnamese textile and garment industry. It was a good choice. This specific product subsequently enjoyed the highest growth rate in the business.

From his experience as a trader, Dang knew the business well—but not the production technology. “We initially bought second-hand equipment from a Taiwanese company,” he explains, “under the condition that the seller would teach us everything we needed to know about operating their machines.”

He and his staff proved to be quick learners. Within two years, the Century team had mastered the fundamentals and began looking for next-generation technological solutions. In order to meet skyrocketing demand and win market share at the same time, Dang boldly decided to double the company’s production of DTY to 9 600 tons per year. He wasn’t going to be able to do that cost-efficiently with yesterday’s technology—and so he made one of the most consequential decisions of his career.

“We decided to buy brand-new equipment from Oerlikon Barmag,” he says simply. “This was a make-or-break investment for us, but given Oerlikon Barmag’s proven track-record for providing energy-saving, operationally efficient machines — plus the company’s reputation for excellent customer service — the decision wasn’t difficult.”

Oerlikon Barmag equipment brought Century to the next level.

Century wanted to produce more sophisticated products, each characterized by reliably high quality. With cutting-



Producing its own POY, Century has a direct influence on its DTY quality.

edge equipment from Oerlikon Barmag, backed by the supplier’s technical support and production management expertise, Century was able to enhance both its capacity and quality control at the same time.

The expansion proved successful, generating financial resources for Century to invest in a POY facility with an annual capacity of 14 500 tons while increasing its DTY production capacity to 15 000 tons by 2008.

Dang realized that by applying a backward integration strategy to POY production, the company could further increase overall product quality and cut production costs. After recurrent phases of expansion, Century factories can now produce 37 000 tons of DTY and FDY every year.

Both as a supplier and a production management consultant, Oerlikon Barmag has been partnering with Century for ten years. That relationship continues to evolve today. Dang tells us that his company is now making investments in production that will increase annual capacity to 60 000 tons by the first quarter of 2017.

According to Dang, Vietnam’s garment and textile sector is entering a golden era with excellent, sustainable long-term growth potential. He is quick to point out, however, “[that] with great



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opportunities come great challenges. In order to remain competitive internationally, a company must offer reliably high quality products at competitive prices, and deliver excellent customer service year after year.” Objectives like these can only be achieved, of course, if the company has modern production facilities, a highly skilled and professional workforce and modern management practices.

Oerlikon Barmag helps Century check off all the boxes here, delivering state-of-the-art equipment, contributing (albeit modestly) to workforce training, and consulting on best practices as Century brings a widely imitated and very capable enterprise resource planning (ERP) system on-line.

This business management tool is a suite of integrated applications that Century will be able to use to collect, store, manage and interpret data from many of their business activities, including product planning, cost management, manufacturing, marketing and sales, inventory management, shipping and payment.

In addition, Century has recently implemented in its brand-new factory a new version of the Oerlikon Barmag’s plant operation center (POC), fully in line with Industry 4.0. Believing that this state-of-art production management technology will help the company to improve production efficiency and quality, hence improving its client satisfaction as well

as the company’s productivity, Jack decided that the POC will be deployed company-wide (in all factories) next year.

Sticking to the essentials

“At Century,” says Dang, “our strategy focuses on the four ‘M’s—namely, manpower, machines, materials and methods. Selecting the right equipment supplier is a crucial factor for success. With state-of-the-art equipment from Oerlikon Barmag, we make high quality products, which meet even the most rigorous demands of our customers. This equipment saves energy — a significant production cost — thus helping Century to build up a reputable brand name as an environmentally conscientious, high-quality yarn maker.”

Century has simple yet effective business and development strategies.



The company focuses on delivering uniform, high quality products, and also on continuously creating new ones. Oerlikon Barmag plays an important role in this process as the company delivers the advanced machinery to Century that ensures optimal quality, versatility and efficiency. Oerlikon also regularly sends its experts to Century to provide after-sales service and deliver practical technological solutions to assist Dang's company in the development of new products.

Gazing toward the horizon

"I believe that the demand for polyester filament will continue to grow," says Dang, "We will be able to meet that demand with a stable supply and stay competitive if we continue to innovate in terms of improving product functionality."

Recent innovations in functionality have included such breakthroughs as hollow, anti-UV, quick-dry, recycled and even flame-retardant yarns. Most of Century's customers are knitting and weaving companies that specialize in sophisticated materials for products procured by world-leading clothing, footwear and home textile brands. These brands include Nike, Adidas, Puma, IKEA, Uniqlo and Reebok.

"Working with Oerlikon Barmag, we're able to provide exactly what our customers need to meet their customers' demands," explains CEO Dang Trieu Hoa. "Oerlikon helps us by updating their machines on an on-going basis in order to provide new solutions that make it possible for us to produce high technical specification products, while saving energy at the same time!" (fl)



The inauguration of phase 3 at Trang Bang attracted many interested visitors.

Optimised processes with Industrie 4.0 solutions

The extended process and production control system Plant Operation Center (POC) can now capture and digitise all the steps of yarn production and processing including plant technology from third party suppliers. In addition, it can be linked to ERP systems such as SAP. The networking of several plants via cloud computing is likewise possible, opening the door for manufacturers to highest process efficiency and transparency at Industrie 4.0 level.

The production technology is linked via computer and Internet technologies, production and machine data are available in real time as well as over the entire value chain, around the clock and anywhere. This allows for extremely fast reaction, creating maximum traceability and planning reliability, and thereby continual improvement of processes, quality and competitiveness. For such scenarios there is meanwhile a term which has become known beyond Europe: Industrie 4.0, the fourth industrial revolution.

The Plant Operation Center of the Oerlikon Manmade Fibers Segment has been extended to fulfil these requirements. The software- and Internet-based control system now captures the complete manufacturing process. In spinning mills for example this extends from melting of the granulate right up to quality testing and approval of the finished POY packages. Upon request it can be extended to further processing to the DTY product in texturing systems. This provides a documented, complete curriculum vitae of each package, enabling full traceability and the targeted search for causes at every process stage.

Job and product tracking: control in real time

At the same time it is clear where quality originates and efficiency prevails, and where not. For every production order is – in interaction with ERP systems such as SAP – generated in the POC, continuously updated and mapped. Using this job and product

tracking system, authorised personnel can track at all times, which product is being produced at which position and in which quality, whether machine performance and production quality are currently correct and whether production is on schedule.

As a result the POC is becoming increasingly mobile and besides the desktop and web-based workstations available from the very beginning, also supports smartphones and tablets.



This is true particularly in the case of tools to control and improve operating performance and task management.

Tools for greater operating efficiency

Operators can also view critical operating conditions and urgent tasks on mobile devices. The appropriate tools provide a clear overview of the processing priorities using a colour code. Thereby operating efficiency can be considerably increased and maintenance and servicing better planned and carried out just in time.

Authorised management personnel can also access the current Key Performance Indicators (KPI), which were previously stored on the POC server or on the Intranet of the customer, per smartphone, anytime and anywhere.



POC is becoming increasingly mobile: It also supports smartphones and tablets.

The current status of the machines and installations can be recognised immediately in regard to target values, via the traffic light colour scheme on the display.

Modular and adaptable – right up to globally-networked production

Particularly interesting for the efficient and transparent production process: In a POC network, information can be exchanged between production sites in a safe and controlled manner. Cloud computing enables the provision of data, KPIs and recipes. This smoothes the way for best practice processes in the global production network.

"With our extended POC our customers receive all information at an early stage to steer course for efficiency and thus success in production. Shift management, personnel deployment and centralised reporting are made easier, and time and resources saved. At the same time we adapt the POC precisely to the requirements of each individual customer", explains Reinhard Muehlenmeister, Head of Software Solutions. This is made possible by the modularity and scalability of the system which can be simply expanded through additional modules at a later stage

According to company information, there are approximately 100 POCs currently installed at customers of Oerlikon Manmade Fibers around the world – and enquiries are on the rise, adds Muehlenmeister: "Quality and traceability are playing an ever greater role in business. There is also demand for highest efficiency, planning reliability and data integration. That's why we are working on the POC of tomorrow - today." The already integrated remote support should then allow for even more intensive machine monitoring. And in certain situations the machines should automatically propose solution options – Industrie 4.0 sends its regards. (aw)

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