

fibers and filaments

the experts' magazine

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Fiber intelligence

The new stars on the textiles stage: smart textiles

They generate heat, light and electricity, they protect the sick, they make cars and buildings more comfortable – and they are on the verge of playing an important role in our everyday lives.



Carpets with a difference

Turkish Boyteks Tekstil produces 'smart' carpets

Carpets clean air, provide a pleasantly cooling sensation, improve the body's biorhythm, reduce stress levels and also smell of roses.





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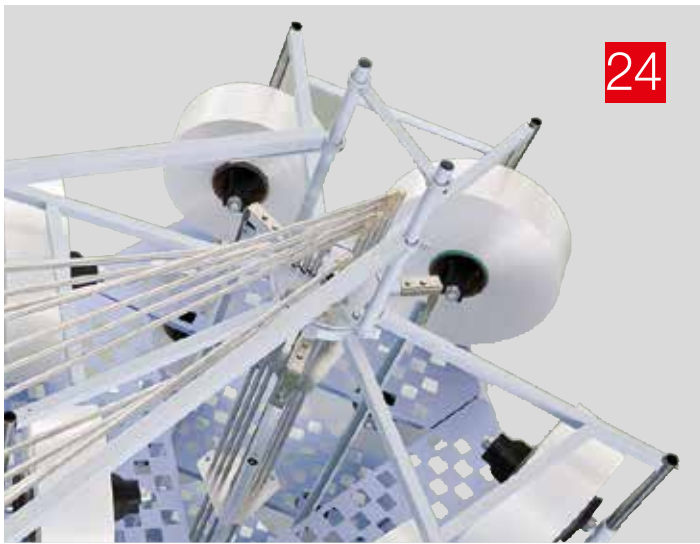
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Editorial



Dear Customers, dear Readers,

Smart textiles are the main topic of the November edition of ‘fibers and filaments’. But what constitutes an intelligent textile? The range is varied. The interesting thing about it is producing functionalities such as connected jackets, conductive gloves or heating shirts for daily use.

Here, some textile manufacturers are already in the market with wearable products. Levi Strauss has just launched a connected jeans jacket into shops in the U.S., which was developed in cooperation with Google.

Vital monitoring is another interesting way to use intelligent fibers, yarns and fabrics. Smart textiles contribute to the telemedical care of the elderly, risk and rehab patients and to the training improvement of athletes. Even home textiles will make our lives easier in the future. Learn more about applications that already exist today.

Industrial textiles have also arrived in the future. For example, the product of a German yarn and fabrics manufacturer is supposed to prevent the formation of mold in buildings. The material can sense humidity and heats itself and the surrounding walls when a critical level of humidity has been reached.

Read the latest news about our manual texturing machine eFK and about trailblazing modifications in the HMLS process. New products and services of our customer service support you throughout the entire lifetime of our machines and systems.

Stories from the markets round off the fall edition of our customer magazine ‘fibers and filaments’.

I am thrilled to be presenting you with a new issue of ‘fibers and filaments’ and hope you enjoy reading it.

Georg Stausberg
CEO Oerlikon Manmade Fibers Segment

Manmade Fibers Conference in China

Georg Stausberg speaks on Industry 4.0 solutions

On the occasion of this year's 23rd Manmade Fibers Conference in Xiaoshan, China, Georg Stausberg, CEO of Manmade Fibers, presented Oerlikon's current Industry 4.0 solutions and outlined first ideas for the future in his talk entitled "Intelligent Manufacturing for the Manmade Fiber Industry". (aw)



Shanghaitex

Digitalization main topic

The Oerlikon Manmade Fibers segment will fly its flag again at this year's Shanghaitex in China, arguably the most important market for the production of textiles and clothing worldwide. From 27. to 30.11.2017 staff members from Oerlikon Barmag and Oerlikon Neumag will welcome all trade visitors to their stand of around 100m² in hall E1, stand number B19 in the New International Expo Centre (SNIEC). The presentation is entirely focused on the digital age. Interesting keynote speeches and presentations on current issues around Oerlikon's Industry 4.0 solutions will be held several times a day at their multifunctional stand. (aw)

Strong footprint in China

20 years in Suzhou and Wuxi

China has always been a major market for Oerlikon's segment Manmade Fibers. This led to the foundation of production and assembly facilities in Wuxi and Suzhou twenty years ago.

On November 6th, the company celebrated this anniversary with all employees from Shanghai, Suzhou and Wuxi, as well as guests from other Chinese locations, at the Suzhou Culture and Arts Center. More than 600 people attended the exciting show program, management speeches and festive dinner. A very special event to say "Thank You" to all employees who are part of the incomparable success of Oerlikon Manmade Fibers in China. (bey)



A strong team forms Oerlikon Textile China, in brief 'OCN'.



ITMF Annual Conference Focus on sustainability



One thing became very clear to the over 250 delegates at this year's ITMF Annual Conference held from 14. to 16.9.2017 in Indonesia: The demands on a globally interconnected textile industry are increasing significantly. Be it in production speed caused by Amazon's first forays into production on demand, be it in the area of new materials with new functional features for the consumer of tomorrow or last but not least in the development of sustainable solutions and textile recycling in the future. The conference covered a broad range of issues and showed first specific solutions by expert speakers. (aw)

Oerlikon Nonwoven at OUTLOOK™ 2017

With over 470 delegates from across the nonwovens and related industries, OUTLOOK™, the primary conference for the nonwovens hygiene and personal care industry, was proven again to be a key industry event for the sector, showcasing EDANA's mission to support the growth of the industry and promote its sustainable development.

Oerlikon participated in that event from 27. to 29.9.2017 in Lisbon, Portugal, with its new nonwoven business team and was able to achieve excellent networking results within the nonwovens community. (aw)

Events

Shanghaitex 2017

November 27-30, 2017, Shanghai, China

www.shanghaitex.cn

Domotex 2018

January 12-15, 2018, Hanover, Germany

www.domotex.de

Middle East and North Africa Nonwovens Symposium

February 6-7, 2018, Dubai, United Arab Emirates

www.edana.org

Outlook Asia

March 14-15, 2018, Singapore

www.edana.org

Egy Stitch & Tex

March 15-18, 2018, Nasr City, Egypt

www.egystitchandtex.com

Domotex Asia / Chinafloor 2018

March 20-22, 2018, Shanghai, China

www.domotexasiachinafloor.com

Inlegmash

March 20-23, 2017, Moscow, Russia

www.inlegmash-expo.ru/en

Techtextil Russia

March 20-23, 2018, Moscow, Russia

<https://techtextil-russia.ru.messefrankfurt.com>

Oerlikon Neumag

Production launch at Xinjiang Tianmu Lake Carpet Weaving Co. Ltd.

The official starting shot for production was fired at the new Xinjiang Tianmu Lake Carpet Weaving Co. Ltd. facilities on August 18, 2017.

The plant at the Gold River Textile and Clothing industrial park in the Shawan region was festively opened within the context of a grand ceremony attended by numerous invited guests from politics and business.

The 40,000-square-meter factory buildings are home to Oerlikon Neumag BCF S+ systems currently manufacturing 2,000 tons of BCF yarn per annum. And this is just the beginning – Xinjiang Tianmu is planning to quadruple its BCF capacities over the next two years.

The Gold River Textile and Clothing industrial park was established as part of the restoration of the Silk Road, which China is planning to return to its former glory. To support this project, Jiangsu Kaili Limited by Share Ltd. established a subsidiary Xinjiang Tianmu Lake Carpet Weaving Co. Ltd. in March 2016. Jiangsu Kaili is the carpet industry market leader in China and has been an Oerlikon Neumag customer for over ten years now.



But developing this region is not the only focus. A 'green environmental protection' concept – which covers the entire manufacturing process – has also been initiated. Xinjiang Tianmu is hoping to transform itself into a benchmark research & development and carpet production enterprise. Due to the low energy consumption per kilogram of yarn and an efficiency level of 99%, the Oerlikon Neumag S+ systems are perfectly suited to this concept. (che)





VDMA B2B Forum in USA and Mexico

The VDMA Textile Machinery Association hosted a B2B Forum and Technology Conference on 6.11.2017 in Charlotte (NC), USA, and on 8.11.2017 in Mexico City.



Oerlikon Manmade Fibers segment presented its latest innovative solutions matching its segment slogan "From Melt to Yarn, Fibers and Nonwovens". (aw)

For further information: www.vdma.org

Oerlikon Neumag

Successful commissioning of two staple fiber systems in India

Two polyester staple fiber lines, each with daily capacities of 100 tons, were installed at Shubhalakshmi Polyesters Ltd. The customer manufactures spun-dyed polyester staple fibers in raw white semi-dull, black and optical white.

Wellknown Polyesters Ltd. also manufactures PET cotton-type fibers. With a daily capacity of 225 tons, this is to date the largest system that Oerlikon Neumag has installed and commissioned in India.



For Shubhalakshmi Polyesters Ltd. and Wellknown Polyesters Ltd., these represent the first staple fiber system investments. Both firms have been producing filament yarn using Oerlikon Barmag systems for many years now. (che)

Staple fiber production is on the rise in India.

Newly founded Oerlikon Nonwovens at SINCE

With the nonwoven business unit newly created in the middle of the year, Oerlikon presented itself for the first time to a broad audience at the SINCE in Shanghai, China. From 8. to 10.11.2017 a competent team of sales persons and technologists answered questions about all topics around Oerlikon's current nonwoven technology solutions in the area of airlaid, meltblown and spunbond at the World Expo Exhibition and Convention Centre. (aw)



Geotextiles are a major application of nonwovens.

Have you heard the news about carpet's allergy-reducing potential?

The new era of magic

Conventional wisdom has long held that people with allergies and asthma should avoid carpeting. Now, new research is debunking those carpet myths – and innovation is ushering in a new era of carpets with 'magical' properties.

From the legend of King Solomon's carpet to the magic tapestry stories in 'One Thousand and One Nights', carpets have long had mystical properties attributed to them, fascinating people around the world. Today, however, carpets' mythic properties have been overshadowed by reports that they collect and harbor legions of contaminants and allergens that could have adverse health effects.

For years, doctors and scientists have been telling people with allergies and asthma to opt for hard surfaced floors, such as hardwood, ceramic or stone tile, and others over carpeting. They claimed that carpets trapped all manner of allergens that could trigger allergic reactions and asthma attacks. One report in the UK newspaper 'The Guardian' even went so far as to say that carpets harbor toxins, including lead, pesticides and carcinogens, at levels far higher than those found on polluted city streets.

But recent research may restore

carpet to its favored place. A recently published study by the Deutscher Allergie- und Asthmabund e.v. – DAAB (German Allergy and Asthma Association) examined the fine dust pollution in households with hard floors compared to households with carpets. The result is dramatic: the average fine dust pollution in households with hard floors is twice as high as in households with carpets. Because of improvements in the fibers used to manufacture it, carpet actually traps indoor contaminants, acting as a constant and effective indoor air filter.

Further confirming this, modern carpet construction and improved manmade and natural fibers and filament structures capture fine particles from the air and trap them. Another recent study by airmid healthgroup limited, a biomedical research organization focused on health issues, found that carpet trapped allergens to a greater extent than hard surface floors, resulting in fewer particles escaping into the air. "Carpet acts as a passive air filter, trapping dust, pollen and other particles and removing them from the breathing zone," says Mathias Stündl, Head of Development BCF (bulk continuous



carpets

filament) at Oerlikon Neumag, a manufacturer of systems for the production of BCF carpet yarns, manmade staple fibers and nonwovens. BCF carpet yarn is one long, continuous fiber that makes up a section of carpet.

Walking and doing other activities on carpets did not release particles into the air. Best of all, carpets cleaned by vacuuming with a HEPA-class filter or with hot water extraction reduced both surface allergens and airborne particle counts, maintaining indoor air quality. Carpets also provide greater insulation and noise reduction, as well as adding comfort and additional design options to various interior décors.

In addition to improving yarn filaments so that they trap dust effectively well, Oerlikon Neumag's innovative machines and yarn production processes help customers manufacture carpets that use less yarn for the same coverage. This leads to significant cost advantages in carpet production. In addition, innovations in sustainable materials make today's carpets emit almost no volatile organic compounds (VOCs) – chemicals released from a variety of products which turn to gases and can affect indoor air quality – in any household furniture or building material.

Innovation in fiber is also leading to some interesting and revolutionary new applications and possibilities. Yarns with low denier per filament allow manufacturers to create softer carpets, while other innovations include exceptional stain and soil resistance. In the

newest developments, yarn and carpet manufacturers are creating carpets with high thermal absorption properties that give the feeling of coolness and which improve indoor air quality even more. With such features and advantages, innovation in carpet manufacturing is ushering in a new era of magic carpets – which are better options not only for those who suffer from allergies and asthma, but for virtually anyone concerned with overall health. (gm)

Because of improvements in the fibers used to manufacture it, carpet actually traps indoor contaminants, acting as a constant and effective indoor air filter.



Smart textiles on the rise

Fiber intelligence

They are the new stars on the textiles stage: smart textiles. They generate heat, light and electricity, they protect the sick, they make cars and buildings more comfortable – and they are on the verge of playing an important role in our everyday lives.

Smartphones are a thing of the past. Instead, calls, news and Internet information will appear on the sleeve of our jackets. Our jeans will help us navigate through the city, integrated electrodes activating our muscles and hence lightly moving our legs in the desired direction in the process. When we meet Jack, his pullover changes color and welcomes us with a radiant red.

Experts believe that such scenarios will be possible in the next ten to 15 years. Ideas, technologies and also developments here and in the case of many other applications already exist – as does the snappy name for them: smart textiles. They unite two fundamentally different worlds: that of highly functional technology and digital electronics and that of fashion, apparel and functional textiles. The prospects of these intelligent super-fabrics are phenomenal. Smart textiles can generate heat, light and electricity, measure temperatures and vital functions, heal wounds and reduce pain, modernize industries and make cars and construction safer and more comfortable. Although their journey into our everyday lives and their respective markets is often a long one (see also interview on page 15).

However, there are ever more developments above all in Europe, USA and Asia, which are about to be launched or are already successfully being marketed. Against this background, Grand View Research market researchers predict that the global market for intelligent textiles and intelligent fabrics will experience huge growth, increasing

from US\$ 544.7 million in 2015 to US\$ 9.3 billion in 2024. The drivers here are application fields such as fashion and wearables, industry and safety, medicine and sports and construction and architecture.

Wearables and e-textiles: Fashion 2.0

Conductive yarns are the basis of many smart applications and were created more than ten years ago; for instance, through electrochemical modification or fiber surface coatings. To this end, the highly conductive ELITEX® yarn – developed by Textilforschungsinstitut Thüringen-Vogtland (TITV/Thüringen-Vogtland Textile Research Institute) – comprises silver-sheathed polyamide. It can be processed using weaving, knitting or embroidering technologies. Obstacles such as fiddly contacts and connection technology, the necessary textile elasticity and resistance to bending have meanwhile been overcome, so that many conductive textile-based or textile micro-systems technology-based (printed circuits) products have already been created.

One of the most popular projects for textile wearables comes from Google and Levi's. In 2016, the Internet and jeans giants announced a denim jacket with which smartphone calls and music can be controlled. This is made possible by conductive, contact-sensitive textiles. The jacket will be on sale for US\$ 350 before the end of 2017. Promising applications also include luminous and heatable apparel: here, the manufacturer Covestro uses LEDs that are placed on malleable films made from thermoplastic polyurethane (TPU)





Has just recently debuted: The Levi's Commuter Trucker Jacket with Jacquard by Google controls your smartphone when wiping over the sleeve.

instead of circuit boards. The provider Warmx is already successfully offering heatable, washable underwear, which generates heat from integrated polyamide fibers using a battery – available from € 269. The heatable skiing gloves by Reusch are also similarly priced.

For industry and safety-related sectors

Another glove supports industry digitalization: equipped with an RFID sensor, it permits automatic scanning of construction components. Mobility industries are not the only promising customers. Here, there is a new car safety belt made from polyester with conductive threads and an integrated

microphone for the hand-free kit. And there is also potential for self-illuminating textile surfaces that could be used in cars or aircrafts as roof linings or for signaling purposes. Here, multilayer fabrics are printed and coated with integrated light conductors in order to enable evenly distributed illumination.

Smart textiles are also suitable for protective apparel. Starting, among other things, with a signal-transmitting baby body stocking, the Germany-based Institut für Textil- und Verfahrenstechnik (ITV/Institute for Textile and Process Engineering) in Denkendorf has meanwhile developed a high-tech protective jacket for the fire and the emergency

services. The heat-resistant, self-illuminating jacket captures information on the vital parameters and movements of its wearer and on the ambient conditions and deployment circumstances, transmitting these to a hub.

From sports and health to medicine

Vital monitoring using intelligent fabrics is of course also a healthcare and medical topic. To this end, smart textiles are contributing to remote medical monitoring of older people, risk patients and those rehabilitating and also improving athlete training. In t-shirts, they measure heart frequency, pulse and breathing, provide information on falls



Intelligent fabrics by the Swiss Schöller Textil AG reflect in the dark (left), conduct heat (right) or are waterproof while also breathable.

in carpets, report the moisture levels in bed linen and detect steps, stride length and step impact when walking. The sensor technology developed for this stretches all the way to fiber-based miniature sensors for monitoring chronic wounds. Institutes at Technical University of Dresden and the TITV have been able to process these into embroidery applications and are in the process of designing entire wound dressings.

And actuator technology is also on the rise. The manufacturer Bomedus is already selling electronic special bands for backs, shoulders, knees and elbows along with amputation stockings.



The Textilforschungsinstitut Thüringen-Vogtland (TITV/Thüringen-Vogtland Textile Research Institute) presents a multifunctional car seat, which aims to improve user health and safety. The institute conducts basic and user-oriented research in the field of special textiles with a focus on smart textiles.



Here, electrodes stimulate pain fibers on the surface of the skin using fine electrical impulses, influencing the 'pain memory' in the process and helping to reduce chronic pain.

And textile construction also becomes smart

Construction with textiles is opening up the most diverse smart applications. To this end, German and South Korean partners have developed a portable air-bag that will protect construction workers from dangerous falls from 2017. Here, a sensor detects corresponding movements and triggers a gas cartridge that inflates the tear-resistant 'ScaffBag' in a matter of milliseconds. And a product developed by a German yarn and fabric manufacturer, which will be available from the end of 2017, is serving a different purpose. The moisture-sensory and simultaneously heating fabric is designed to prevent mold. Once a critical moisture level has been reached, the fabric band heats up, heating the surrounding walls in the process.

And architects and interiors outfitters and designers are also benefiting from smart fibers. To this end, special fabrics and LEDs can be used to manufacture three-dimensional, very large-scale light screens, used for company presentations or trade fair stands, for example. Ettlin, a German industrial textiles, spinning and weaving specialist, created the technological basis for these. A German-Belgian project consortium has succeeded in combining textiles and luminous surfaces. Here, electroluminescent ornamentation and a conductive layer were printed directly onto textile backing. These were used for illuminated wallpaper and furniture light installations, for instance.

The future: energy generated from fibers

Smart textiles do, however, still have one major weakness: they draw power



The Institute Textiles and Process Technology Denkendorf (ITV) Babybody sensor captures vital parameters including breathing and heart frequency, for instance. According to its own information, the ITV is the largest textiles research center in Germany with a total of 200 employees.

from batteries, which limits comfort. But could textiles themselves not generate – and save – energy? South Korean researchers are responding to this question with a material that carries two layers: one coarse silicon grid and a special silver film. These rub against each other during movement, electrostatically charging themselves and generating energy in the process. The Thüringische Institut für Textil- und Kunststoff-Forschung (TITK/Thuringian Institute for Textiles und Plastics Research) is focusing on thin piezoelectric threads, which can be inexpensively produced as endless filaments. Their core is made from conductive, carbon black-filled polypropylene and can then be woven into or embroidered onto textile fabrics. Stretching, pressure and vibrations, which occur when they are used as sensors, generate an electric voltage. Combining numerous piezoelectric threads should permit a rich 'energy harvest'.

There is still much that needs to be done before smart textiles transform our everyday lives. The challenges relate to standards of quality and data protection, moderate product prices and consumer acceptance. Finally, it is about justifying the high initial investment as soon as possible. But there is also progress and opportunities. To this end, manufacturing processes such as 3D printing – as is being currently spearheaded by the Oerlikon Group – could enable classic fabrics and innovative new fabrics or processing of new raw materials, hence accelerating attractive marketing possibilities. And – last, but not least – smart textiles could make their own manufacturers more competitive: then, Jack scans yarn bobbins using a sensor glove and his suit lights up red whenever a spinning machine signals an error message. (tho)

“Expectations are one thing, feasibility another”

In an interview, Dr. Klaus Jansen – Managing Director of the Germany-based Forschungskuratorium Textil e. V. (FKT/ Textile Research Board) until 2017 – describes the long journey that smart textiles often have to embark on before they are ready for market launch.



Dr. Klaus Jansen sees the opportunities rather than the risks of smart textiles.

» **Dr. Jansen**, projects focusing on smart textiles are meanwhile quite common. But there have also been breakthroughs within the German market, right?

An example of this is heatable underwear with conductive fibers. Or textile back bands with electrodes designed to help reduce chronic pain. Products of this kind have been successful for some time now. The past has however taught us that it can take time before they are ready to market or find acceptance.

» Why is that?

Expectations are one thing, feasibility another. Some developments are fast, others take several years. In 2005, people believed that we would be walking around with displays integrated into our jackets. From the R&D perspective, there is still so much more to do, as many disciplines and new technologies are involved. Nevertheless, we have to speed things up from a market perspective especially in Germany and increasingly see the opportunities and not so much the risks. In Asia, for example, society and the markets are more open to smart textiles, where innovations are available more quickly, although they often fail to provide our standards of quality.

» And what smart textiles will be making it big in the future?

Healthcare and construction products, above all. Measuring vital functions, preventing diseases and diagnosing them early, increasing fitness – these are some applications with huge potential, particularly in Germany. But smart textiles designed to make buildings more intelligent are also very promising.

» Could yarn manufacturers also be involved in this future market?

Yes, for instance with spinning techniques or the production of endless fibers for processing conductive or insulating polymers. Or for surface coating yarns. Here, it is however important that yarn manufacturers are involved early on in R&D projects and that they interact with users and institutes. By the way: smart fabrics could also be useful in textiles production – as apparel that informs wearers that they have assumed a harmful posture, for example. Such applications are already the focus of developments. (tho)

Manmade Fiber Congress in Dornbirn focuses on sustainability

This year's Manmade Fiber Congress in Dornbirn, Austria, was attended by an estimated 700 participants from over thirty countries.

This reflects the huge interest of the manmade fiber industry in this innovation platform, which was supported by Oerlikon Textile with a bronze sponsorship.

Next to the various exciting lectures on fiber innovations, hygienic and healthcare applications, protective applications and sports and leisure wear, the congress offers an ideal opportunity for networking.

The day before the opening of the congress, several experts from along the textile processing chain discussed sustainability in the textile industry in a workshop & discussion platform entitled "Circular economy: textile & nonwoven waste". This was also the leading topic during the opening session of the congress. Other noteworthy lectures covered the recyclability of manmade fiber mixtures comprising cotton/PET or viscose/PET and water use and water waste management during the production of manmade fibers compared to natural fibers.

Other highlights included contributions on a new biobased polyethylene furanate (PEF), the growing interest in biobased polymers, and super-high-tenacity yarns based on ultra-high molecular weight polyethylene (UHMWPE).

Young scientist forum on innovation processes

A networking platform for young industry scientists took place on the last conference day. From Oerlikon's Manmade Fibers segment, Marc-André Herrndorf, POY Research & Development, was invited to the forum. The participants came from diverse departments in their companies such as quality management, digital unit, process engineering and R&D. The main topic of the event was "The impact of the digital (R)evolution on research & development". The focus was on the development process, the handling of trends and the possibilities of innovation management.

Where do ideas come from and how are they transformed into innovations in the digital world?

These questions were discussed in a lively manner during the forum. The important factors in these cases are generating ideas through new channels, rapid prototyping and testing in virtual worlds. Therefore, interdisciplinary exchange and creativity are among the most important factors within the innovation process. (rdo)



Circular economy, waste management and recycling were among the focus topics of this year's Manmade Fiber Congress in Dornbirn.

Sustainable Textile School & Textile University 4.0

Launch of the modern spirit and sustainability within the textile value chain

International specialists from across the textiles industry gathered at the University of Chemnitz, Germany, between September 18 and 20 for the premiere of the Sustainable Textile School.

For three days, experts from research and industry shared their knowledge on how the various businesses across the textile value chain can be transformed towards a sustainable approach. The mission – to enable professionals and students from all sectors of the industry to have a close look at all value-added stages focused on sustainability – brought together 127 attendees from 14 nations for intensive discussions. Each day of the three-day event covered a special focus: the days were dedicated to fibers, chemicals and fabric & transformation.

Systems supplier Oerlikon Manmade Fibers contributed a speech on solutions and technologies driving sustainability in manmade fiber and filament production. These are, according to speaker Markus Reichwein, Head of Product Management at Oerlikon Manmade Fibers, mainly

- Solutions for mechanical and chemical recycling processes
- Spun-dyeing processes and technologies for masterbatch and liquid color processing
- Energy-saving technologies in spinning processes, i.e. WINGS FDY and other e-save certified machines, systems and components
- Efficiency, supported by the digital Plant Operations Center (POC)
- Industry 4.0 / Smart Manufacturing concepts



As Markus Reichwein summed up, “creating value through sustainability is a major target in the textile industry today. Value is versatile, it can be created through sustainable production processes by means of efficient machines and with the help of smart data, as well as through recycled or biobased raw materials and closed-loop recycling within the textile value chain. My focus is to push for the optimum combination to achieve best-value sustainability.” The Sustainable Textile School also served as the kick-off for the so-called “Textile University 4.0”, which describes a new way of co-working to promote sustainability within the textile value chain. (bey)

For further information, go to:
www.sustainable-textile-school.com.

Head of Oerlikon Manmade Fibers' Product Management, Markus Reichwein, spoke on solutions and technologies driving sustainability in the man-made fiber industry.

Carpets with a difference



Carpets keep our feet warm, carpets dampen noise, carpets decorate rooms and carpets function as passive dust and pollen filters. But Boyteks Tekstil is demonstrating that carpets are capable of even more. Their carpets clean air, provide a pleasantly cooling sensation, improve the body's biorhythm, reduce stress levels and also smell of roses.

How is this possible? Boyteks has set itself the task of not only creating fabulously attractive designs, but carpets that have a positive influence on people's health and wellbeing. For this, they have developed processes that transform their BCF yarns – manufactured using Oerlikon Neumag systems – into smart carpets.

The amethyst has been considered a healing stone for centuries now. It is believed that they have cleansing, inspiring and insight-providing properties. They are usually worn as necklace pendants. But why not walk, stand or even sit on amethysts for a change? That must be scratchy? Absolutely not! Boyteks has developed a carpet that contains amethyst particles, while still remaining wonderfully soft. It is believed to have an invigorating effect and convert negative energy into positive.

And 'Cooler' by Boyteks is no less impressive. As a result of its thermal conductivity properties and thermal absorption capacities, this carpet can lower the skin's temperature by approximately 1 °C. Hence, it is able to

create a pleasantly cooling room ambience, something very much in demand in warmer climates.

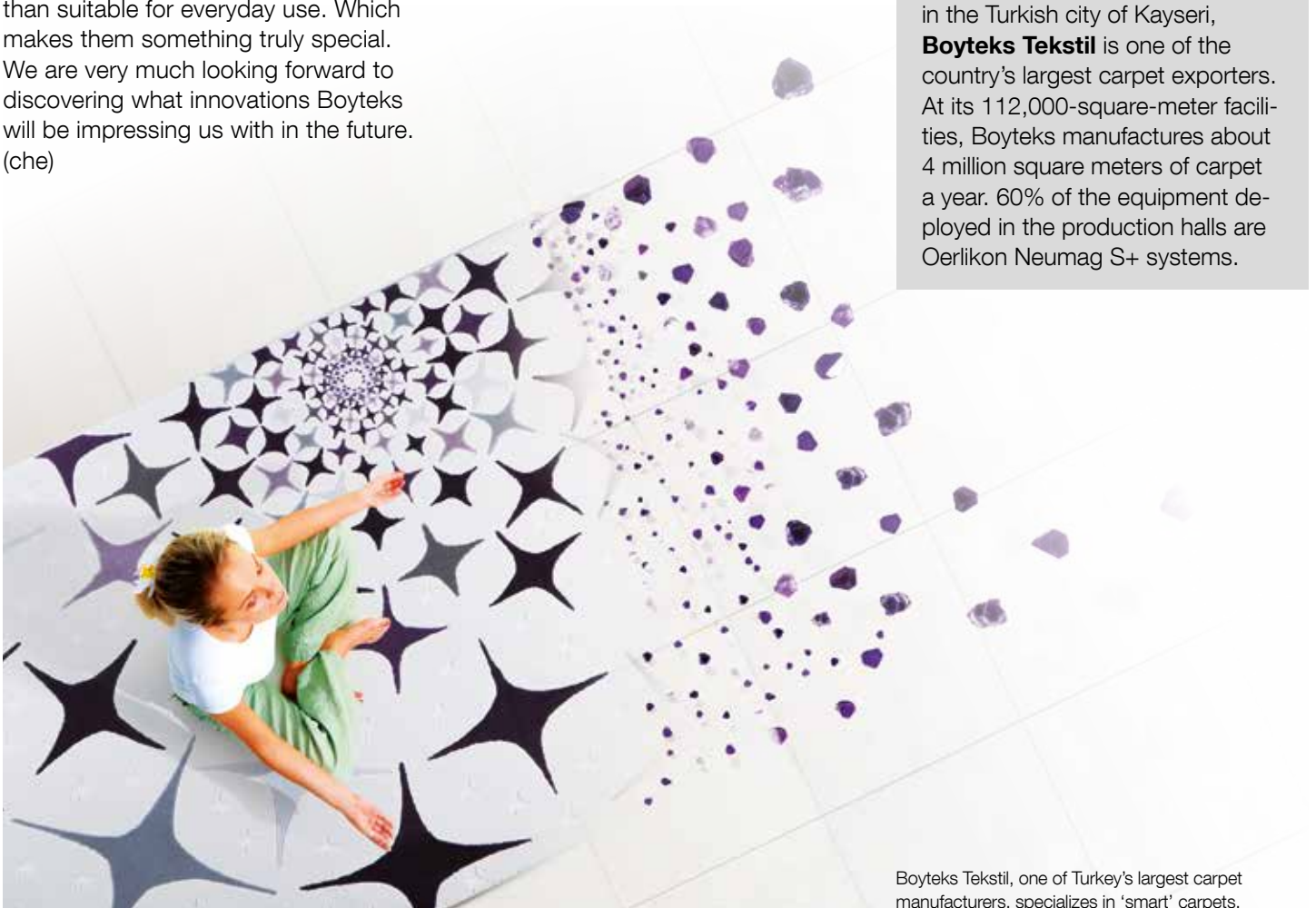
And 'Triple Fresh' also improves ambient wellbeing, as it rids the air of unpleasant odors and hazardous gases. A specially developed metal complex woven into the carpet is the catalyst. Instead of just covering them up, it breaks down unpleasant and hazardous gases, creating pure air in the process.

These are just a few of the innovative, smart carpets that Boyteks has in its product portfolio. But the other products are no less striking, also catering to people's wellbeing. Even though their descriptions may sound somewhat unusual, they are nonetheless quite ordinary carpets that are more than suitable for everyday use. Which makes them something truly special. We are very much looking forward to discovering what innovations Boyteks will be impressing us with in the future. (che)



About

Founded in 2011 and located in the Turkish city of Kayseri, **Boyteks Tekstil** is one of the country's largest carpet exporters. At its 112,000-square-meter facilities, Boyteks manufactures about 4 million square meters of carpet a year. 60% of the equipment deployed in the production halls are Oerlikon Neumag S+ systems.



Boyteks Tekstil, one of Turkey's largest carpet manufacturers, specializes in 'smart' carpets.

Talking to Mohammed Abul Kalam

“Modern Poly focuses on backward integration”

Bangladesh is emerging as one of the rising stars of the global economy. Considering the potential of Bangladeshi economy, PwC ranked Bangladesh as the 31st largest economy in the world in 2016 and is predicting Bangladesh to be the 23rd largest economy by 2050, surpassing the Netherlands, Australia, Spain, Thailand and Malaysia.

To date, Bangladesh has not really been considered a focus market for manufacturing manmade fiber yarns – despite the country offering huge potential in the domestic and the export markets. However, the Bangladeshi textile industry focuses predominantly on the downstream process steps. In contrast, raw materials such as yarns, fibers and textile fabrics are mainly imported from China, India and other Asian countries.

Here, filament yarn manufacturer Modern Poly Industries Limited, an associate concern of T K Group of Industries, sees an opportunity for this emerging economy. ‘fibers and filaments’ had the privilege of speaking to Mohammed Abul Kalam, Chairman of one of Bangladesh’s large conglomerates, about his plans for the future.

» **Mr. Kalam**, you have just expanded your filament capacities and have further expansion plans for filament and staple fiber production in the near future. What are the reasons behind this?

Currently, the domestic market potential for manmade fiber yarns cannot be satisfied by domestic production. This makes the country and its textile industry dependent on imported raw materials. More capacities for yarn production give us the opportunity to integrate a greater share of the textile value chain into our domestic industry. This helps the country and its people.

The integration of a polycondensation system gives the yarn producer a stronger influence on the yarn quality.



And, of course, we have plans to export our yarn to other countries that are more focused on the DTY business or even further down the textile value chain.

» Furthermore, you are planning a backwards integration by investing in a polycondensation plant. What is the reason for this?

Well, the main reason is that we depend on others regarding quality, price and availability when importing raw material. Having our own polyconden-

“More capacities for yarn production give us the opportunity to integrate a greater share of the textile value chain into our domestic industry.”

sation plant, we will be independent of the raw material markets and, moreover, we will have consistent melt quality, which leads to consistent yarn quality. This is essential if we want to enter the international high-end yarn market.

» What was the reason for choosing Oerlikon in the case of former projects? And why are you discussing present projects with Oerlikon?

First of all, 'Made in Germany' quality has been a major deciding factor. We rely on Oerlikon's technological superiority. The extensive experience with Oerlikon Barmag as a supplier has proven us right.

Another point was that, compared to other systems manufacturers, Oerlikon's equipment had and has the most convincing arguments when it comes to conversion costs, operating costs and efficiency.

» You will be the first company in your country to run a staple fiber plant and a polycondensation plant. Do you see yourself as a trendsetter?

Yes, definitely! Being the first one to have a certain technology gives us a competitive edge. And I am sure that other companies will follow our lead. (bey)



The Modern Poly management with Mohammed Abul Kalam, Abu Sufian Chowdhury and Nasim Anwar (third from left to right) visited Oerlikon Barmag's facilities in Remscheid to discuss current and future projects.

“Having our own polycondensation plant, we will be independent of the raw material markets and, moreover, we will have consistent melt quality, which leads to consistent yarn quality.”

About

Modern Poly is a subsidiary of the Bangladeshi BSM Group, founded in 1984 as an affiliate of the T K Group of Industries. Under the Polyron brand, the company produces POY, DTY and FDY, both raw white and dope-dyed, at its facilities in Chittagong, Bangladesh for downstream processes within the group of companies. This includes warp knitting and circular knitting, as well as sales in domestic as well as foreign markets. With its current capacity of 26,500 tons per year, it is one of the largest filament yarn producers in Bangladesh.

T K Group of Industries started its business journey in 1972. T K Group of Industries has 42 independent companies focusing on edible oil, cement, basic chemicals, petrochemicals, textiles, steel, leather, tea plantation, shrimp hatchery and commodities trading. T K Group of Industries is one of the leading and most diversified enterprises in Bangladesh with more than 10,000 employees.

Beens Grass-Yarns BV is a new player in the artificial grass market In collaborative partner

Beens Grass-Yarns BV, a new company recently founded in the Netherlands, enters the artificial grass market with a monofilament line for artificial grass by Oerlikon Barmag.

Beens Grass-Yarns BV successfully entered the monofilament production business with Oerlikon Barmag equipment.

The newcomer is part of the Beens Group located in Genemuiden in the province Overijssel. The extrusion line type MaryLine 1400 produces monofilaments in two colors or shapes. As downstream, the line contains the new two-end inline-texturing as well as inline-wrapping of the monofilament face and infill yarns. Artificial grass yarns are produced in the high-end segment especially for the use in the rapidly growing area of landscaping, but also for sports turf.

'fibers and filaments' spoke with company founder and owner Geert Beens

about the recently completed project and his vision for Beens Grass-Yarns.

» **Mr Beens**, why did you enter the artificial grass market? What was the reason for your investment in a monofilament line for artificial grass?

"We felt valued as a customer and very well looked after."

Artificial grass has high potential. I want to be the go-to supplier for basic products for grass carpet tufters in Europe, based in Genemuiden. Artificial

grass yarns are key in this market and I want to support our customers with high quality yarns to develop this growing market.

Within the Beens Group we produce a process water treatment as well as carpet-backing compounds. In this respect, the addition of the production of artificial grass yarns to our portfolio is indeed a sensible step.

» Why did you choose Oerlikon Barmag as partners?



ship to new horizons

After in-depth market research, I chose Oerlikon Barmag for various reasons. The company has tried-and-tested methods and technology, is fully integrated and controls and runs its projects from start to successful operation on time. The after-sales service is also a key factor for me. Furthermore, Oerlikon Barmag supports my vision: "Never stop innovating".

» How did the project develop? How do you rate your collaboration with Oerlikon Barmag?

The process started with excellent guidance from Oerlikon Barmag in terms of consultancy to provide us with the necessary supports, people and interfaces. We were in regular and close contact with them throughout the whole project. We ran trials in the Chemnitz lab facilities to prepare recipes and product samples for the start of our yarn sales process.

The delivery was right on time and we started production as agreed on.

Challenges, which occur, and always happen, were solved through good co-operative partnership. We felt valued as a customer and very well looked after. Technicians were on hand for immediate support, both remote and on site.

» How important is the topic quality – yarn as well as equipment quality – for you?

Beens Grass-Yarns BV quality is an essential success factor. Being able to continuously supply our customers with consistent product quality is a key driver. The yarns have to be reproducible and of constant quality over a long period of time. This means that the whole process must be under control. Equipment, recipes and our trained staff are synonymous with quality; in other words, quality is a result of optimal integration of "hard and software". This is another reason why we chose Oerlikon Barmag as partner for this project. The company supports this process, too.

"After-sales service is a key factor for me."

» What are your future plans?

Of course we have the intention to grow. Ongoing development and adjustment of our product range based on customer demand is a daily business. However, with Oerlikon Barmag at our side we profit from their experience. Trials for our new product ideas are already scheduled.

Mr Beens, thank you for this interesting conversation. We wish your young company every success. (jwe)



eFK – Evolution in Texturing

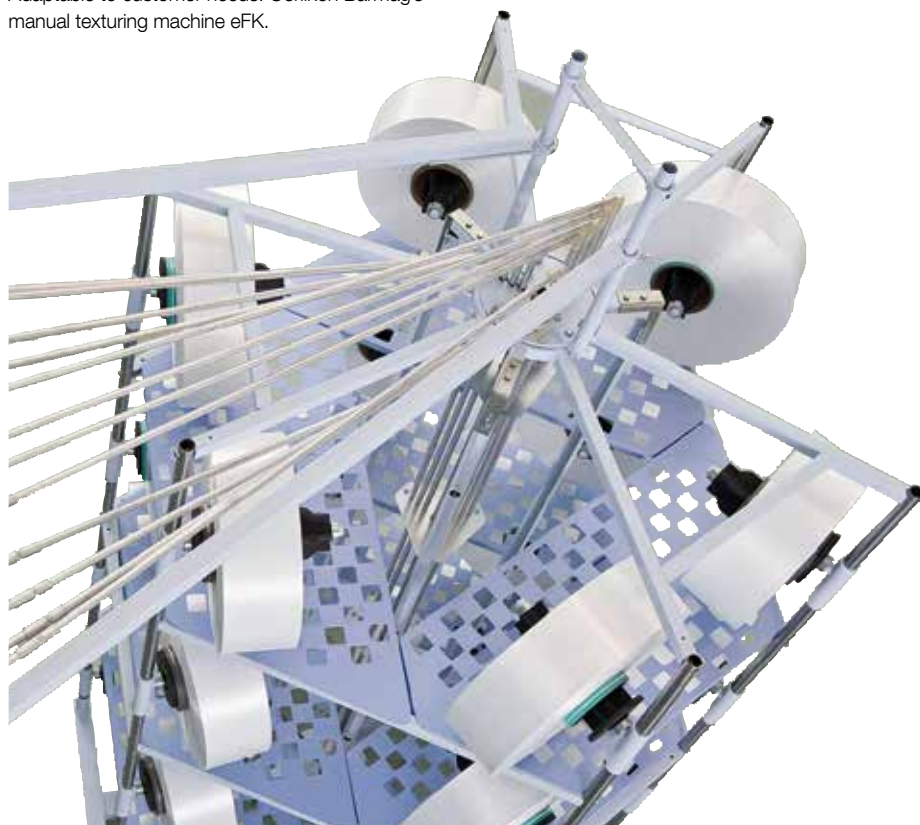
Proven technology with expanded product window

The manual texturing machine eFK has been showcasing the evolution of ‘made by Oerlikon Barmag’ texturing for some time now.

Tried-and-tested components combined with new technologies provide maximum efficiency, profitability and significantly improved handling of the machine. The trailblazing godet technology for the yarn feed before and after texturing in combination with the Advanced Take-up Technology (ATT) guarantee a consistently high yarn quality and process stability associated with optimised energy consumption and maintainability.

The ATT ensures a perfect package build including density control at higher maximum package weights resulting in increased productivity. The signaling of the running length for each position and deck previously determined by doff timer assists the operators in achieving a higher uniformity of package running length, which is important for the further processing of the yarn.

Adaptable to customer needs: Oerlikon Barmag's manual texturing machine eFK.



eFK combines reliability and excellent quality in texturing.

Simultaneously, it is possible to give the packages grading marks based on production dates, which makes the classification for the subsequent process steps considerably easier.

eFK 2017 - Wide range, ease of handling

With the Release 2017 Oerlikon Barmag is now continuing on the path of evolution. The expansion of the eFK product window for high-denier yarn opens up a whole new market segment, which the yarn manufacturer can supply with the accustomed high quality. At the same time, handling and maintenance work have become considerably easier. This is in part due to the enhanced yarn suction gun, the redesigned lubrication, the simplified adjustment of UNITENS¹ sensors as well as the improved integration of hardware for special processes like hot pins or elastane composites.

Hot pins for example are used in the production of special yarns such as “thick-and-thin” yarns. To achieve the thick and thin effect, the yarn is drawn around a heated pin in irregular movements. Hot pins require one addi-

¹ UNITENS is an internationally registered trademark exclusively owned by Saurer Fibrevision Ltd., Macclesfield, UK.

HMLS spinning line

Modification promises even better yarn quality



tional feed unit for operation. The larger space between godets G1 and G1.1 takes this into consideration and allows for an easier access to the hot pins.

The blending of elastane with PET or PA yarns aims at improved comfort in the end product. Usually a two-step process, the elastane covering device of the eFK makes the production and covering of yarn possible in one step, hugely improving the economy of the process. By covering yarns with elastane during the texturing process, an even better stability of the final yarn product can be achieved, which is beneficial for further downstream. Additionally, godet G2.1, which is guiding the elastane yarn, is now positioned on the same side as the texturing units. The resulting significant reduction in thread deflection and strain leads to much better yarn qualities.

Using the e-save heaters considerably reduces the energy consumption of the eFK by 200 watt per heater. High-quality insulation materials in an enclosed casing ensure lower energy costs.

The eFK will continue to provide Oerlikon Barmag's clients with a highly efficient DTY machine with the latest godet feed technology and benefits for best yarn quality. It combines highest yarn quality with great product flexibility through different configurations and ideal process devices. (wa)

In order to improve its HMLS spinning performance and yarn quality, the Chinese premium tire cord fabric manufacturer, Zhangjiangang Junma Tyre Cord Company Ltd., has just commissioned a modified Oerlikon Barmag HMLS spinning line.



With the new design, it is possible to use higher intrinsic-viscosity (IV) PET and also to minimize the inevitable IV drop between melt and yarn. Subsequently, this leads to higher achievable tenacities and lower EASL (**E**longation **A**t **S**pecific **L**oad) values in the HMLS yarn. This also reduces the tenacity loss after the greige cord is dipped.

Needless to say, the improved yarn quality – standard for Oerlikon Barmag HMLS systems – can be produced at high winding speeds of 6,300 m/min at high machine efficiency levels and low break rates. The maximum process speed of Oerlikon Barmag HMLS lines is 6,500 m/min.

First production results have been positive; the new designs will already be implemented in the newly ordered lines, which will be installed by the end of 2017. (rdo)

Oldies but goldies

Staying ahead through lifetime

Production systems are the capital behind the success of yarn manufacturers, now and in the future. For this reason it is of eminent importance to maintain and future-proof the machines.

That is why sooner or later every yarn manufacturer has to face the challenge of how he can reasonably continue to produce the required yarn quality with his old systems and machines. First off: There is no generally correct answer to the question if modernisation or new investments are the right solutions. This needs to be considered on a case-by-case basis.

In general, Oerlikon Barmag offers its clients the opportunity to bring old plants in quality and performance up-to-date with current market requirements. This applies to larger components as well as to smaller ones. The WINGS XS for example is an available solution for equipping older machines with modern winding technology. But even small components like ceramics offer considerable advantages in regards to product quality and efficiency.



Sustainable technologies – less is more

Smaller batch sizes and a higher flexibility in production often cause a higher waste rate because of the more frequent product changes. In this case, it can be more sensible to use the modern eightfold WINGS XS rather than the tenfold and twelfold thread winders. The WINGS XS also impresses with an optimised energy consumption due to the elimination of the cold godets and the simpler operation of the draw field from the ground.

In regards to energy savings, the replacement of two sixfold winders with one twelfold winder can also be an option depending on the type of application. “Here, layout and yarn path have to be considered beforehand”, stresses Dr Wolfgang Ernst, responsible for Service Sales at all Oerlikon Manmade Fibers segment sites. Apart from reduced energy consumption through the use of modern electrics, a further advantage lies in the much greater availability of spare parts for modern winder generations.

Operations, maintenance and repair

Modular trainings on demand

With the professional, customized training offerings of Oerlikon’s segment Manmade Fibers training team, technicians and operating staff are transformed into experts.

Well-trained employees get the most out of a production system. They increase productivity and quality, cut downtimes and rejects. The experienced training team from Oerlikon Manmade Fibers supports customers’ technicians and operators in becoming experts

Onsite trainings offer a hands-on training for technicians directly on the individual equipment.



management



A system can only produce quality for life if the details - such as yarn guides - remain in focus, too.

But even in spinning, older systems can be replaced with modern solutions like the double-in-one (DIO) spin pack or in the case of specialties like Bico with systems which usually have the same overall dimensions of the spin beams. The double-in-one spin pack reduces the production costs by increasing productivity. DIO unites two independent spin packs in single housing, hence providing the same performance as two single-end spin packs with simultaneously 25% less space requirements. A beneficial side effect of the DIO is reduced energy consumption due to the lower heat loss.

Additionally, existing extruder spinning plants can be modified in a way that makes them suitable for other products like spun-dyed yarns, which are increasingly sought after in the market. The Oerlikon Manmade Fiber segment has the perfect solutions for the dosing and mixing of additives on masterbatch or liquid base. If an existing spinning plant is required to produce a different denier range, the existing layout of the melt-guiding components will limit dwell time, drop in pressure etc. Our engineering experts can assist here with tailored solutions that enable a conversion to coarser or finer denier ranges.

Upgrades – attain new goals

Even supposed trivialities influence machine productivity and yarn quality significantly. That is why Oerlikon Barmag with the cooperation of renowned partners rely on a special procedure for the manufacturing of ceramics with the goal of reducing the wear susceptibility, soiling tendency and friction. Apart from a longer service life, new oilers have the advantage of enabling a distinctly more even yarn oiling drive because of their special geometrical design, thereby positively influencing the further processing of the yarn. In addition, they also decrease the oiling usage by reducing spray-off.

In redeveloping the thread guide, the focus was on significantly reducing the yarn friction and thereby the formation of lint. This greatly increases product quality during further processing. All in all, new ceramic components in the yarn path offer great potential for improvement in further processing in the downstream and thus a good opportunity for yarn manufacturers to position themselves more advantageously in the market.

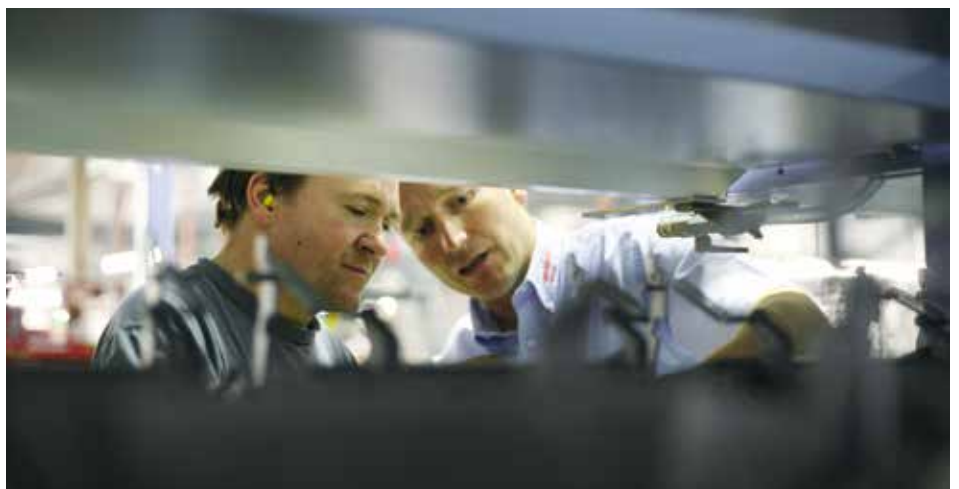
As partner and solution provider for economic and high-quality production processes the Oerlikon Manmade Fibers segment offers a broad range of options to help the most important capital of their clients to a long and successful life. (wa)

on their respective equipment. Tailor-made training programs are held in the company's modern training center in Germany, at service stations throughout the world or even at the customer's site.

The training program comprises

- Safety training
- Winder mechanics and electrical engineering, testing equipment for winders, electronic troubleshooting and replacing components
- Pumps
- Extruders and filters
- Reading circuit diagrams and explaining functions
- Guide – installation and operation
- Spin pack handling

Many of the training modules are also offered as e-learning programs. (bey)



Further information

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