Welcome to the first edition of our ITMA Technical Textiles Bulletin – our new regular round-up of the latest advances in this fast-moving segment of the textiles industry. The demand for technical textiles, functional apparel fabrics and nonwovens is increasing across the globe, in both developing regions and established markets, thanks to the tailored performance, sustainability benefits and cost advantages that these materials can offer compared to some of their more traditional alternatives. From filtration materials tackling the global megatrends of clean water and air, to life-saving protective fabrics and the increasing range of end uses in the automotive industry, next-generation technology is helping to open up new markets and applications for textiles like never before.

As such, you can expect to see a much greater emphasis on new technological solutions catering to these requirements at ITMA 2015.

Visitors to the show can also look forward to a new conference on nonwoven technology, markets and product areas, which is being organised in association with the Europe-based association of the nonwovens industry EDANA. Our agreement with the organisation signifies the start of a new partnership that is in line to underscore the importance of the technical textiles and nonwovens sector at ITMA 2015.

Research and development makes a vital contribution to the further growth of this industry so in the wake of its successful introduction in 2011, CEMATEX is once again providing a grant to all participants in the Research & Education Pavilion at ITMA 2015. We are inviting even more organisations to leverage the platform to showcase their projects capabilities and programmes to provide a comprehensive showcase of the research landscape that is shaping the market for future generations. Experts from the participating institutes will be presenting their insight and details on current and future projects at the Speakers Platform too.

We hope you enjoy reading the first issue of this Bulletin and welcome any feedback you may have,

Charles Beauduin, President, CEMATEX
www.cematex.com
Rhodia has announced the commercial launch of its Amni Soul Eco yarn, a biodegradable polyamide yarn that is said to disintegrate in landfill by 50% in a little more than a year. The polyamide 6.6 yarn has been developed to allow Amni Soul Eco clothes to quickly decompose after being disposed of in landfills. The yarn made its debut during the São Paulo Fashion Week (SPFW) in the Ronaldo Fraga’s collection, with exclusive Santacostância’s knitted fabrics. “This release is Rhodia’s commitment to the sustainability and the textile industry,” said president of Solvay’s Global Business Unit Fibras Francisco Ferraroli. “Currently, polyamide fibres take decades to decompose. With this product, the decomposition time reduces to less than three years. This is a major breakthrough for the whole textile industry, thereby we contribute to the environment of the future generations.” Ronaldo Fraga was chosen because of his history in fashion and environmental issues. He is well known for using sustainable materials in his designing textile collections. “The Amni Soul Eco yarn is the beginning of a new era in sustainable materials for the 21st Century’s clothing,” he said. Rhodia said the yarn maintains all the benefits of polyamide, including a soft touch, maximum comfort, freshness, moisture management, easy-care, lightness and endless colour options, allowing the industry to produce a wide variety of biodegradable garments.

Outlast launches PCM filling material for apparel

Outlast Technologies is introducing a new phase change material (PCM) filling for the apparel market called Spherix. The new material is a blend of PCM viscose fibres and polyester fibre balls, designed to provide dynamic climate regulation and comfort properties in apparel such as jackets. The company had previously launched PCM polyester filling materials in the bedding market. For the apparel market, Outlast has combined the fibre balls with a short cut fibre in a 30% PCM viscose short cut fibre/70% standard polyester ball blend. The filling material has been developed to be soft and light, as well as breathable for dynamic temperature management. The technology is said to provide proactive climate regulation, controlling the production of moisture before it begins, rather than simply wicking away humidity. “With 7 dtex, the diameter of the viscose fibre is quite high, so we can reach an approximately four times higher performance compared to our standard PCM viscose fibre,” said Martin Bentz, managing director of Outlast Europe GmbH, Germany. While Outlast technology is typically seen in winter applications, the company says Spherix can be used in summer apparel too, such as light outdoor wear or summer quilted jackets. The manufacturer originally developed its technology for NASA, to protect astronauts from temperature fluctuations in space.
Teijin launches high performance outerwear fabric

Teijin Frontier Co Ltd, the Teijin Group’s fibre-products converting company, has developed an advanced, high-comfort, high-density fabric for outerwear, called Delta 2000.

The fabric is the latest addition to Teijin’s Delta series which are designed for sporting applications. Delta 2000 has a distinctive structure comprising a warp of densely and finely crimped bulky yarn and a weft of ultra-thin yarn. The company has minimised air spaces three-dimensionally to achieve 2,000 mm of water resistance, while an aerated fine-waffle structure is said to provide excellent water-shedding performance.

Delta 2000 has also been engineered to offer good moisture permeability, a comfortable soft texture and a luxurious surface appearance without coatings. Teijin Frontier is targeting sport, fashion and uniform applications for the new fabric.

US military to utilise ITL’s fabric technology

UK-based Intelligent Textiles ITL has signed a major contract worth several million pounds with the US Department of Defence, as part of a joint project with BAE Systems (the British multinational defence company) and Synetic Designs of Canada. This follows a contract to supply its materials to the British Ministry of Defence secured during 2013, following four years of MOD-funded further development.

The company has developed an e-jacket that can reduce the weight carried by infantry soldiers by streamlining the huge number of batteries they carry. Its effectiveness is due to the way the electronics are woven into the fabric in order to create, in effect, a flexible circuit board that connects together all of the soldier’s equipment. This enables the use of a single power source instead of the multiple batteries that currently weigh soldiers down.

“By weaving the electronics into the fabric, we’ve created something like a ring-main in a house for a soldier,” said co-owner Asha Peta Thompson. “It also takes away the need for heavy cabling.”

The soldier system containing the ITL technology is due to go into trials with the US Department of Defence at the beginning of 2015 and if all goes well, both UK and US soldiers could be wearing their intelligent uniforms later that year.

“They’re taking a tiny little company in the UK seriously because we’ve ticked off the technology risk and because of the work we’ve done here,” she said. “The technology is building its own momentum. We’ve got an infrastructure for all the equipment but the armies haven’t yet decided what they’ll be carrying. I honestly believe that the British ground soldier system is ahead of its time. We’re ahead of other nations at the moment.”

IFG announces high performance fibre investments in Asota

International Fibres Group is investing in the high performance fibre segment at its Asota site in Austria. The company has revealed plans to increase production capability through machinery customisation from a leading supplier and expects the new high performance fibre product range to be available to the market during the second half of 2015.

IFG said this strategic move into high performance fibres, and the investment in state-of-the-art machinery at the Asota site will help to further strengthen its market position for polypropylene staple fibre.

The group is a leading producer of polypropylene staple fibres that find application in the automotive, geotextile, floor covering, industrial and textile markets. It has four operating entities worldwide, three in the European division (Asota GmbH, Drake Extrusion Ltd and Exelto NV) and one in the US division (Drake Extrusion Inc).
Arvind OG enters nonwovens business

Arvind OG Nonwovens Private Limited, a joint venture between Arvind Ltd and OG Corporation of Japan, inaugurated its manufacturing facilities in a ceremony at the facility near Ahmedabad, Gujarat, in late May. The JV will manufacture high quality nonwoven fabrics using needlepunch technology for bag house filtration, artificial leather and a variety of other applications. The JV also has a technology alliance with Kureha Ltd of Japan.

Arvind OG has installed custom-built machines specifically designed to achieve Japanese quality standards and capable of handling various fibres such as M-aramid, homopolymer, acrylic, polyphenylene, sulfone (PPS), polyimide polypropylene and polyester. The unit started production in May with one needlepunch line, with total investment of nearly INR 50 crore ($8.4m) and targeting to reach turnover in excess of INR 100 crore ($16.9m) in three years. Beyond this, Arvind said it will continue to expand capacities in this as well as other technologies within the nonwoven fabrics space, which will be an important pillar of its technical textiles growth strategy going forward.

At the inauguration, Mr Punit Lalbhai, executive director of Arvind Limited and CEO of the Advanced Materials Division said, “This is a big milestone for Arvind and for AMD. It marks our entry into the highly attractive nonwoven fabrics space, and we are looking to aggressively grow this vertical with our Japanese partners. Beyond this, we are also looking to invest in other technologies and product categories in the nonwovens space going forward.”

Mr H Machino, managing director of OG Corporation India and director of the India JV, said: “Keeping the future in mind, India is a very important marketplace for OG Corporation. We are therefore delighted to partner with Arvind and establish a nonwoven fabrics manufacturing facility in India.”

Milliken acquires Westex Inc

Milliken & Company has acquired Westex, in a move that strengthens the company’s offer of flame-resistant (FR) fabrics for protective clothing. The two companies provide a portfolio of fabrics for industrial workers who need protection from arc flash, flash fire and other thermal hazards.

Westex was established in 1919 and has over 50 years of experience manufacturing flame resistant fabrics. The company’s brands include UltraSoft, UltraSoft AC, Indura, TrueComfort, Moda-Quilt and Vinex, serving end users in the utilities, electrical maintenance, oil and gas, and metals industries.

“We look forward to welcoming the Westex team to Milliken & Company,” said Jeff Price, president of the speciality fabrics division at Milliken & Company. “As we look to the future, we are committed to changing the experience for industrial workers with FR innovations that further improve comfort and productivity.”

“All of us at Westex look forward to joining a strong, values-based company with a long heritage of innovation,” said Mike Enright, vice president of sales and marketing at Westex. “Westex has a proven track record of developing FR technology, products, and strong end-user relationships that help customers develop successful programs. By combining our collective R&D talent, deep customer knowledge, and market access, we will strengthen our capabilities and offer workers the highest levels of FR protection and comfort.”

Westex provides a wide range of flame-resistant solutions
New footwear technology offers all-round breathability

WL Gore’s Gore-Tex brand has launched the new ‘Surround’ technology for hiking footwear, providing all-round breathability for the wearer without compromising the shoe’s waterproofing properties. The new technology completely encases the foot, keeping it drier by allowing sweat to be transported away through the Gore-Tex laminate, positioned on the underside of the shoe. Water can then move into the open structure of the ‘spacer’ and out via the side ventilation outlets, the company explained. Dryness is an important factor for hiking boots, as it prevents rubbing and helps avoid the development of blisters on the skin.

Twenty-five of the world’s leading outdoor footwear brands will be bringing the first Gore-Tex Surround collections to market in their coming 2015 spring ranges. The technology is already being used in casual and children’s footwear, with the difference that excess heat and moisture are transported out of the shoe through large openings in the sole. The footwear is currently featured in the collections of 15 brands globally, including Salewa, Viking and Lowa.

Always innovating

Dyneema was first introduced in the 1970s but over 40 years later the applications for the proprietary Ultra High Molecular Weight Polyethylene (UHMWPE) fibre continue to expand. Tara Hounslea catches up with DSM Dyneema CEO Gerard de Reuver to discover how the company works to stay ahead of the curve and where new opportunities lie.

Gerard de Reuver is a 12-year veteran of DSM and has a career spanning over 30 years in life sciences. He heads up the DSM Dyneema business, which today boasts a patent portfolio relating to the fibre, tape, sheets, technology and products of over 150 inventions protected by over 600 filed patents and patent applications worldwide. And this is continuing to expand. He explains: “The category of performance fibres is broad and loosely defined, and has changed over time as real performance capabilities have emerged.” In contrast to many other fibres, Dyneema started out in technical applications before shifting to apparel applications. Dyneema has been in use in mooring systems for supertankers and offshore drilling platforms for more than 20 years, the same for ballistic protection and cut resistant gloves for more than ten. “Although we are relative newcomers to the apparel industry, we understand the value of innovation and the need to create differentiation. The newer Dyneema fibres are designed for various tasks in specific fields, such as in bullet resistant vests (ballistics), ropes (bending fatigue) or gloves (cut resistance).”

The company found that these same performance advantages in other fields can be applied in apparel. Fresh concerns surrounding issues of protection level, safety standards and sustainability are beginning to play a more significant role, which is opening the door for materials such as Dyneema.

“The market for functional fibres in apparel is huge,” says Mr de Reuver. “We currently have our first success with Levi’s jeans and as you can imagine the application can be...
EuroFibers, one of the company’s European distribution partners set up by ex-DSM Dyneema duo Marcel Alberts and Jan Kriele in 2010, cut Dyneema into a staple fibre and blend it with cotton. The result was a very strong yarn but with the look and feel of cotton. The denim brand liked the idea and created the Levi’s Strong series, a more durable version of their flagship jeans targeting skateboarders, snowboarders or people in physically demanding jobs.

The performance benefits of Dyneema including high strength, low weights, durability, cut and abrasion resistance, and ballistic protection have led to its widespread use in diverse applications such as bullet-resistant armour used for vehicles, bullet resistant vests and helmets for personal protection, clothing, ropes, cables and fishing nets and safety gloves. However, the company is not content to stop there.

“The challenge often is to successfully transform the fibre into textiles and other fabricated forms, and we have a large team of application development engineers to support this,” he says. Recent advances in the area of deep sea mooring include the Dyneema Max Technology, which combines weight and strength advantages with a unique resistance to creep, while the Dyneema Diamond Technology relates to cut-resistant fibres gloves for the food, metal and glass industry. The latest launch is the Dyneema Force Multiplier Technology, which was introduced to the personal protection industry last year and has recently been extended to vehicle armour.

“Regular Dyneema used in vehicle armour is already up to 50% lighter than older technologies like aramids, and 90% lighter than steel. Dyneema Force Multiplier Technology for vehicles is a further 25% lighter on top of this, yet offers exactly the same level of protection,” he says.

Mr de Reuver is optimistic about the future for performance fibres, pointing to a current growth rate of 3-5% on a year to year basis. “We expect, with the advantages of light weight and premium ballistic performance, double digit growth in the coming years,” he confirms.
TTRI develops wearable technology products for medical applications

The Taiwan Textile Research Institute (TTRI) has developed wearable technology products for medical applications utilising its proprietary 3D elastic electrode technology. With its high density 3D fibre parallel connection, the 3D elastic electrode differs from traditional electrodes as the electric current is constant throughout. It can be used in electric engineering and communication such as transmission, induction, heat generation and actuation, to replace both metal- or graphite-ebonite electrodes.

TTRI describes the combination of textile and electrode as providing a revolutionary smart textile product for the next generation. The technology has been engineered to be flexible, while offering breathability and comfort. It can be washed and reused.

The 3D elastic electrode has 30 patents in various fields such as materials, production, systems and end products. One of the products targeting the medical market is Cardio Care, which offers compression support for the muscles and sternum, in addition to the real-time monitoring of heart rate variability. It sends the data to a smart wristband or watch device using Bluetooth Smart and ANT+ data transmission protocols.

Cardio Care received distinction in the Red Dot design Award 2014 and has passed various international certifications including ISO and CE.

Techtera and Axelera launch textile coating research

Two research clusters in the Rhone-Alps region of France – Techtera (technical textiles) and Axelera (chemistry and environment) – have launched the Solarclym project, aiming to develop translucent sun-protective coatings for textiles and other surfaces.

They envisage coatings that will be translucent or transparent when used on textiles and other surfaces, whilst protecting them from the sun’s deleterious effects, including overheating, ageing and damage. One version might provide insulation by transmitting visible light while reflecting UV and infrared wavelengths.

The project, involving a total of seven partners, is set to last for 3.5 years and is valued at €2.4m. It covers products from the textile industry and the varnish market.

Researchers to develop textile ‘artificial uterus’ for premature babies

Scientists at the Hohenstein Institute are working with Beluga Tauchsport GmbH and M. Zellner GmbH to develop an ‘artificial uterus’ providing sensory therapy for premature babies.

Research suggests that premature babies miss the spatial confinement and prenatal sensory stimuli of the womb (uterus). This can have significant consequences for the babies later on and can lead to the children suffering from sensory or motor deficiencies as they develop, which have to be treated.

The German scientists are working on a research project to develop a textile ‘artificial uterus’ which is intended to recreate the environment and sensory simulation of a mother’s womb in the incubator.

The specifications for this kind of medical product are very demanding. Firstly, the material properties of the textile, such as its feel, elasticity and resistance, must simulate conditions in the womb as realistically as possible. The artificial uterus will also incorporate a mechanical textile actuator to provide the sensory and motor stimuli and sensation of equilibrium that will promote the development of the infant’s brain.

The sensory impressions need to be provided to the baby immediately after its premature birth. The researchers said that children born too early often find it hard to judge spatial distance, control their muscle tension or perform complex sequences of movements.

The design will also incorporate the mother’s heartbeat into the artificial uterus, which is said to have a soothing effect on the newborn child and can stimulate its development.
Research matters

There are currently no medical products available on the market that allow sensory integration therapy in baby incubators. This artificial uterus will therefore be the first textile ‘therapist’ of its kind, because until now incubators have only provided a constant temperature, the necessary humidity and a controlled oxygen supply. The team, led by Prof Dr Dirk Höfer of the Hohenstein Institute, expects to produce the first prototype of the artificial uterus with motor and acoustic textile actuators as early as next year, when it will be tested in practice by neonatal doctors specialising in the treatment of premature babies.

Turkey joins Horizon 2020 R&D programme

Turkey has signed an agreement with the European Union (EU) in Istanbul, granting association status to research entities from the country in respect of EU research programmes. Turkey will receive full access to the EU new seven-year research and innovation programme, Horizon 2020. Horizon 2020 is the biggest EU Research and Innovation programme, with nearly €80bn of funding available over seven years (2014 to 2020) – in addition to the private investment that this money will attract.

Today’s agreement was signed by European Commission director general for research and innovation, Robert-Jan Smith and Ahmet Yücel, acting undersecretary of Turkey’s ministry for EU affairs.

European commissioner for research, innovation and science, Máire Geoghegan-Quinn, said: “Turkey is a much valued partner. Its dynamic business environment is a perfect test bed for the development of innovative products and services – making cooperation a win-win for researchers and enterprises on both sides.

“Horizon 2020 offers more funding for innovation and small companies than ever before so Turkey is in a good position to see its participation in the programme increasing.”

Turkey has been associated to EU research framework programmes since 2003. Under the last programme (2007-13) over 1,000 participations from Turkish public and private institutions in some 950 projects received almost €200m in EU funding. It is expected that Turkey will use its association with Horizon 2020 as an opportunity to strengthen its capacity building on research and innovation at national level. Its current level of investment in R&D of less than 1% of GDP is well below the EU average of just over 2% and the target it has set itself for 2023. Turkey is the third EU partner country to become associated to Horizon 2020.

French and Japanese governments formalise textile co-operation

Following six years of partnership between the two French innovation clusters Up-Tex and Techtera, and the major entities in the textiles and advanced materials sector (the Japan Chemical Fiber Association, the Society for Fiber Science and Technology of Japan), the governments of France and Japan have signed a Memorandum for Co-operation for Textiles.

This development comes two years after the establishment of a Franco-Japanese work group, which, in the first three meetings (March, June and November 2013) had already laid the foundations for a strengthening of ties between the two countries through an action plan involving business-to-business meetings, exchanges, dissemination of information, and joint projects.

This Memorandum was signed by Techtera, Up-Tex, the JCF, the SFST, the DGClS (directorate general for competitiveness, industry and services – attached to the French ministry for production), and the METI (Japanese ministry for the economy, trade and industry). It clarifies the specific action to be undertaken jointly by the two governments, and is to be redefined in three years.

The programme includes B2B meetings, joint seminars, exchange of contacts and information; strengthening of relations between French and Japanese firms; brainstorming sessions, joint research and development (promotion of exchanges between French and Japanese laboratories/universities, creation of dual qualifications, etc.); co-operation in the fashion and clothing industry; and action to strengthen the dialogue between the two governments.

The progress of this cooperation will be presented annually to the Franco-Japanese Committee for Industrial Cooperation. But, the organisations said the results are already measurable: a new French delegation will fly to Tokyo on September 28, on the occasion of the International Symposium of the “Society for Fiber Science and Technology”.

3D printing of smart wearable medical devices

A new partnership has been formed to create advanced wearable medical devices using 3D printing technology. Dublin City University (DCU) and the Australian Research Council Centre of Excellence for Electromaterials Science (ACES) are working to develop
wristwatches that can monitor the composition of sweat and smart textiles that sense movement in limbs or variations in body chemistry for applications in sports, personal health, rehabilitation or medical therapeutics. Further strengthening a twenty year collaborative relationship, DCU will become a new partner of the world leading materials research group ACES as the centre moves into a new phase of AUD$25 million (€17.2m) funding through the Australian Government. “The partnership will leverage DCU strengths in sensing technologies to translate research into functional 3D Printed devices for medical applications with real socio-economic impact,” said Professor Dermot Diamond, director of the National Centre for Sensor Research at Dublin City University. Described as BioPrinting, the process of 3D printing devices compatible with the human body is an area of expertise of the ACES group in Australia. The ACES-led organisation, the University of Wollongong, houses a world class fabrication facility and is home to internationally renowned experts including DCU graduate Dr Stephen Beirne. “We are excited to be able to take our collaborative research with DCU to a new level as ACES enters a new phase of funding that allows us to develop new dimensions in our research, training and social engagement programs,” said ACES director Professor Gordon Wallace. “World class 3D printing facilities are a tremendous catalyst to forge world class collaborative research programmes that can tackle complex multidiscipline research challenges.” The results of the partnership will include production of intelligent monitoring systems for both wearable and implantable devices.