

Fiber Makers Offer Sustainable Solutions

Fiber innovation is tied closely with consumer trends and new product developments.

By Tim Wright, *Editor*

Growth in the nonwovens and hygiene markets is being driven by the increase in penetration of the use of disposable products in new markets as well as the consumers' desire for ease-of-use products in established markets. The demands of aging populations and an increased need for convenience products are leading fiber manufacturers to develop for instance fibers allowing products to be flushable or to contain special features such as optimized moisture management.

Geographically, the U.S. and Europe will remain key markets for the nonwovens industry and are clearly supported by continuing growth rates there. While growth in these regions will be moderate at single digit levels, the industry is looking at double-digit growth in Asia, Eastern Europe and MENA. Asia and China in particular will take the lead in terms of total volume while markets in Eastern Europe and South America are also continuing to develop.

While the Asian market and the MENA region have the highest potential for growth, the sustainability trend will be coming mainly from the U.S. and Europe. This along with the global growth and development of new markets will ensure a healthy environment for the further growth of the nonwoven and fiber industry.

Lenzing supports growth with modern production line

Lenzing continues to be a leader in cellulosic fiber innovation. Its sustainable and botanic fiber Tencel is engineered to meet the demands of high performing products while being sensible to the environment. Several Tencel fiber developments address the needs of specific market segments. Tencel Skin is optimized for usage in facial masks, Tencel Biosoft is ideal for hygiene products and Tencel Touch is the optimized wipes fiber.

Angelika Durz, Lenzing's marketing and communications manager BU nonwoven fibers says the cellulosic gap theory predicts a growing demand for cellulose-based fibers in the years ahead. "Combined with an increasing awareness of sustainability, fibers that are based on renewable raw materials and produced in an eco-friendly way clearly have a competitive advantage," she says. "Lenzing continues to invest in its fiber plants globally and will start producing Tencel at its new flagship plant in Austria in 2014."

Lenzing announced earlier this year that it is building what it says

is the most modern fiber production line in the world in Lenzing, Austria. The combined expertise and technologies of Lenzing and the Tencel Group, which were recently merged, are being applied for the first time in the construction of the state-of-the-art Tencel plant.

"Tencel represents the greatest technological innovation in the manmade cellulose fiber industry since the invention of the Viscose fiber around 100 years ago," says Dieter Eichinger, vice president business unit textile fibers, Lenzing AG. "The developments of the last 20 years are just the beginning of a success story which will continue for many decades to come. Tencel uniquely answers the demands for competitive production costs relative to other fibers with the demands for sustainable production."

An investment of €130 million and a 24-month construction time frame have been planned for the Tencel plant. The new Lenzing fiber plant will have a capacity of 64,000 tons per year. In addition to the specialty fibers Lenzing Modal and Lenzing FR, Tencel will also be produced at the new site in Lenzing. Tencel is currently only produced at the Lenzing sites in Heiligenkreuz (Austria), Grimsby (U.K.), and Mobile (U.S.). As a result of erecting the Tencel plant in Lenzing, the site will be expanded to become the central location for the Lenzing group's specialty fibers. The attractive energy costs that result from the onsite energy generation, the skilled workforce and proximity to Lenzing's central research facilities including the Tencel pilot plant were all critical factors for expanding strategic operations in Lenzing the company says.

The nonwoven market shows in general in all regions continuous growth and this is guaranteeing a healthy fiber market. "Depending on the individual markets, fibers for nonwovens do satisfy both the needs for commodity and specialty solutions," says Durz. "In the case of cellulosic fibers, this is in a range from a viscose application in basic wipes to Tencel shortcut fibers for specialty filter solutions."

A specific development to be seen is the trend and demand for sustainable solutions. "Sustainability is more than a fashion trend. Sustainability is demanded from the consumer side and more and more retailers are developing sustainability scorecards as part of their purchasing decision process," says Durz. "Manufacturers able to offer sustainable solutions will be better positioned for the future. Lenzing has been a leader in the area of raw materials and continues to invest in this direction as shown by its' green solutions for hygiene

products' featured at the IDEA show."

Durz says while natural fibers offer sustainable solutions in many cases they can't cope with the demand of state-of-the-art nonwoven machinery. "In these cases cellulosic fibers such as viscose and Tencel do offer both sustainability and processability ensuring to provide competitive solutions to the market," she says. "This will further ensure a continuous demand and growth for cellulosic in nonwovens."

Eastman launches microfibers platform

In April, Eastman launched the new and highly innovative Cyphrex microfibers platform, which enables new nonwovens solutions to the market and provide the potential for a unique, game-changing fibers tool kit. "These microfibers offer tunable fiber properties of size, shape and material that provide wetlaid nonwoven producers with competitive advantages that aren't currently available," says Fred Dulin, director, microfibers platform, Eastman Chemical Company.

Cyphrex microfibers, which are less than five microns in diameter, deliver a high surface-to-mass ratio and offer a narrow diameter distribution. They provide optionality of fiber cross-sections in shapes such as round, flat and wedge. The fiber material can consist of different polymer types, such as PET, PP and nylon, and has consistent properties that enable unprecedented formulations and design flexibility.

"Eastman has long had an investment in research and development and manufacturing for many successful products," says Dulin. "At its Kingsport, TN, headquarters, Eastman has a world-class synthetic fibers developmental spinning line as well as a nonwoven and specialty paper research lab."

Captimax is a new, best-in-industry fuel filtration media offering from Ahlstrom and marks the first product to be brought to market with Eastman's Cyphrex microfibers. The media is suited for fuel filters in passenger and commercial heavy-duty vehicles and off-road machinery.

"What we are bringing to the market is truly unique. For the size range we are targeting, to offer high surface area to mass ratio synthetic fibers that are highly uniform and easily processed in wet-laid systems is unprecedented," says Dulin. "In addition, Cyphrex offers tremendous optionality with Eastman's ability to manipulate size, shape and material. For example, by using Cyphrex microfibers, Ahlstrom created media for a filter that allows manufacturers to obtain optimum micron efficiency ratings and dust holding capacity without making compromises. Captimax provides a balance of excellent small-particle retention and the potential for longer media life."

Sustainability trends are strengthening in the nonwovens markets. "Both regulatory and consumer preferences are, for example, driving toward cleaner air, water and fuel, which translates to an opportunity for nonwovens producers to bring new, higher-performing media for filtration," says Dulin. "With their ability to raise performance in fine filtration applications, Cyphrex microfibers give nonwovens producers another set of tools to deliver products that will support that sustainability need."

In conversations with nonwovens producers over the last few years, Dulin says he has consistently heard about the ceiling they



Eastman Cyphrex microfiber synthetic pulp unlocks new opportunities for high-performance, high-value solutions in nonwovens markets such as air, water or fuel filtration; specialty papers; and battery separators.

reached with the fibers they have worked with historically. "It seems that much of the innovation has focused on taking steps to work around the limitations of the fibers," he says. "With the introduction of Cyphrex, we are offering a new set of tools that will give nonwovens producers innovative possibilities through fibers."

Additionally, Dulin says he sees the possibility for collaboration throughout the value chain to improve the innovation cycle and the likelihood of success. "Eastman, for example, has made significant investment in a wet lab for applications development as well as a nonwovens testing lab," he says. "The company has hired some very seasoned scientists from the nonwovens industry. Our purpose is to understand, well enough, the dynamics of nonwovens systems and how our fibers, commercial and developmental, can impact those systems. We believe investment allows us to have better-informed conversations with our nonwovens customers and target materials for development that have a more meaningful impact."

Polyester fiber specialists

Wellman International is one of Europe's leading producers of high quality polyester staple fibers made from recycled post consumer PET bottles. The company says it is Europe's largest PET recycler, processing 2.2 billion post consumer PET bottles annually and has a fiber capacity of 85,000 tons per year.

For nonwoven applications, polyester in all forms from fiber to filament, from apparel to high performance applications remain in a strong position. "Key requirements of the market today include functional fibers with specialized structures and physical characteristics," says Frank Gleeson, managing director, Wellman. "Other developments include the enhancement of fiber properties, via polymer modification, cross section and fiber finish."

Recycled PET fibers in the polyester market continue to gain market share in hygiene, industrial and technical applications. Healthcare demands and an increasing age profile are likely to be key influencers of the fiber and nonwovens market. "Growth areas include medical, hygiene and personal care and industrial markets," says Gleeson.

At Techtex 2013 Wellman International is announcing a collaboration with Hologenix LLC as the exclusive producer of Celliant staple fiber in Europe. Celliant is a revolutionary technology that harnesses the body's natural energy through the use of min-

erals and fibers. According to the company, products containing Celliant have been clinically proven to increase blood flow and tissue oxygen levels and help balance temperature.

“The inclusion of Celliant in our product portfolio, compliments our ever expanding range of products suitable for semi-medical applications such as our Wellcare portfolio of products, which offer solutions for asthma and allergy, antimicrobial and anti-dustmite management, and also our exclusive vapor management system Cirrus,” says Gleeson. “For industrial applications, fibers such as the Wellman profile pt fiber range, feature distinctive spatial arrangement and allow for greater surface area and delivery of enhanced thermal, acoustic and hydrophilic functionality, which is of particular value to our industrial and filtration customers. In automotive our Oleophobic fiber range delivers a unique oil/water repellent action for specialized applications.”

Moving forward the company says that validated sustainability, incorporating both raw material and process efficiencies is becoming an increasingly important factor of the fiber and nonwovens business, with traceability an absolute requirement. “For the retailer marketing ‘green products’ is becoming more and more essential to address CSR requirements,” says Gleeson. “Wellman has invested significantly in its own raw material base with two flake processing facilities in France and the Netherlands which provide feedstock for the fiber production facility in Ireland. Wellman International is both the largest recycler and R-PET fiber producer in Europe.”

Trevira offers technical textile solutions

Trevira is intensifying its activities in the field of technical textiles and at this month’s Techtexil its program covers fiber—including bicomponent fibers in polyester and PLA Ingeo, flame retardant and other special fibers, and yarns in polyester, standard and spun-dyed filaments, as well as microfilament and hybrid yarns.

Trevira filaments cover a broad range of applications for technical textiles. Flame retardant yarns for the construction of exhibition stands and print base materials (Trevira CS) are now standard. In addition, there are special yarns for medicine and hygiene textiles, as well as textured PBT filaments as a basis for transdermal patches and bandages.

Hybrid yarns constitute an important specialty. Here a low-melt component (NSK) is combined with a Trevira standard or flame retardant filament.

Using thermal treatment, textile fabrics made from these hybrid yarns can be controlled and shaped almost at will, and finally fixed in this state. They can in fact also be described as thermoplastic composites/prepregs. The single-material composition of these products (100% Polyester) means they can be recycled. They can be finished in a variety of ways, all energy-saving and they are dyeable and printable. This makes them an interesting alternative, in both ecological and economic terms, since a

stiffening coating of acrylate, for example, becomes superfluous. When used in combination with flame retardant Trevira filaments the materials satisfy important international fire standards.

Mixing Trevira NSK filaments with glass and/or carbon filament makes it possible to produce high-performance thermoplastic composites or prepregs, e.g. for vehicle construction.

With staple fibers Trevira continues to focus on customer-specific product developments. Standard elements in the delivery program are short-cut fibers for airlaid and wetlaid applications, for instance in hygiene products or the paper industry. Flame retardant fibers are also increasingly found in nonwoven products.

The extensive range in bico fibers comprises the various raw material combinations, such as PET/PE, PET/Co-PET and PET/PBT. Bico fibers in core-sheath technology are used primarily in the manufacture of thermally bonded materials (nonwovens), for

instance in the automotive sector, for insulation and filtration materials and also for hygiene products.

In new developments within its fiber program Trevira is focusing more and more on ecological solutions. The sustainability concept in this product range is mainly based on optimizing existing products in the PES fiber program, such as a PET/PE fiber with low melting points. This saves energy during processing and/or allows a higher operational throughput. In addition, the range of fibers in biopolymers (PLA) for a variety of technical applications has been

extended. It now includes a PLA/PLA bico fiber that is currently at the commercialization stage.

Recycling is also an important issue. At Trevira headquarters in Bobingen, work is proceeding on the development of a concept for recycling Trevira products.

Kelheim Fibres offers Olea, Bramante and Danufil CS

Kelheim Fibres GmbH is a producer of specialty cellulosic fibers and a leading producer of fibers for the tampon industry. As such the company operates in niche markets where trends are often less pronounced than in markets for standard fibers and nonwoven products. “Demand for our specialty fibers is strong and we see modest growth in the sectors in which we operate,” says Mathew North, commercial director, Kelheim Fibres. “Overall we see significant potential for cellulosic fibers in nonwovens as demand for absorbent fibers derived from natural raw materials will continue to grow.”

Kelheim Fibres has many years experience successfully serving global customers from its factory in Kelheim, Germany. While the bulk of the company’s business remains in Europe and the Americas, the business in Asia is also showing healthy growth.

“The fiber market has always been highly competitive and the additional capacity for cellulosic fiber production in Asia during the past 10 years has been challenging for producers based in Europe,” says North. “Kelheim Fibres has however proven that it is able to compete on the basis of a strategy driven by innovation and specialization com-



Photo courtesy of Lenzing.

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bined with products of the highest quality and more than 75 years' experience in the production of cellulosic fibers."

Kelheim says its latest development, Olea, is the world's first intrinsically hydrophobic viscose fiber and combines the typical properties of a viscose fiber such as softness, skin-friendliness and wearer comfort with water repellency. "As the hydrophobic effect is incorporated in the fiber matrix itself, it is durable and cannot be washed out," says North. "For the nonwovens market, Olea is an environmentally friendly alternative for cover- and back-sheets in hygiene products. Olea can be used as a sustainable alternative to oil-based raw materials in hygiene products."

In contrast to Olea, Kelheim says its Bramante fiber delivers increased levels of absorbency and water retention capacity relative to standard viscose fibers. "Bramante is characterized by its segmented hollow structure in the wet state—it stores fluid inside the fiber, which minimizes rewetting—even under pressure," says North. "Hygienic applications and washable incontinence products are just some end-uses in which Bramante helps deliver enhanced performance."

The latest addition to Kelheim's range of products is Danufil CS, a flame retardant viscose specialty fiber, which has been adopted from the bankrupt Finnish fiber company Avilon. Particularly in the U.S. market with its strict regulations on fire safety, the fiber is used in the manufacture of nonwoven barrier fabrics in mattresses.

Sustainability issues are important in a market where the products are designed as single use, according to North. "The cellulosic fibers produced by Kelheim are manufactured from a sustainable raw material—wood pulp from managed plantations—and as such can make a strong contribution in this area," he says. "The wood pulp used is certified to either PEFC or FSC standards and the fibers produced have been certified as compostable. Kelheim's products offer a unique combination of sustainability and functionality."

North says Kelheim sees significant potential for the use of viscose fibers in wet laid nonwovens and paper applications for such diverse markets as wipes, security papers and beverage filtration. ■

New HyDri Cotton is Perfect for Feminine Care Products

HyDri Cotton is a new product from Barnhardt Natural Fibers Group. Soft, HyDri cotton allows moisture to pass through while remaining dry to the touch making it perfect for topsheets and coverstock in diapers, femcare and incontinence products.

"This is a perfect "All Natural" replacement for extruded films or poly-based materials in sensitive areas where comfort is paramount to skin contact," says George Hargrove, Barnhardt VP sales and marketing. "The unmatched performance of cotton is now available through HyDri Cotton."

Cotton continues to be preferred to other fibers especially where there is contact with the skin says the company. HyDri Cotton is hypoallergenic and all natural resulting in less irritation and more comfort.

For more information about HyDri Cotton from Barnhardt Natural Fibers Group contact George Hargrove, 704-376-0380 ext. 1213, or visit www.barnhardt.net.