World-wide news and novelties from technical textiles and nonwovens industry

Groz-Beckert: Best nonwovens product line

For more than 150 years, Groz-Beckert has supported the machine builders to the textile industry. During this period, Groz-Beckert has developed from being purely a manufacturer of knitting and hosiery machine needles into the most important system supplier of precision components in the field of textiles and beyond. Step by step, the company has branched out into the business sectors of Sewing Machine Needles, Felting and Structuring Needles and Gauge Parts Tufting – complemented most recently by the important sector of Weaving Machine Parts and Knitting Cylinders.

Fine gauge fork needles: For production of random velour products

Random velour products are becoming increasingly popular in the automotive industry. For a number of years, Groz-Beckert has successfully met the needs of this market with 38, 40 and 42 gg fork needles. The latest development not only satisfies current trends and the requirements of customers, but also goes one step further. The 43 gg fork needle permits the processing of ultra-fine fibres (e.g. in blends of 1.1-3.3 dtex) for random velour products.

To achieve the utmost strength in conjunction with the optimum fork size, it is now possible to combine working parts in 40 gg and 42 gg with very fine fork openings (43 gg).

Depending on the desired surface characteristics, typical crown needle applications can now also be covered by fine gauge fork needles.

The characteristic attributes of fine gauge fork needles are:

- ❖ High uniformity during structuring process.
- ❖ Pronounced loops (granular texture).
- ❖ Exceptionally dense surface quality, thanks to efficient fibre processing capacity.

Product appearance can be influenced by DG or VG for setting.

HyTec® GEBEDUR®: Groz-Beckert jet strips with long service life

GEBEDUR® products from Groz-Beckert represent consistent further development that is far above standard.

HyTec® GEBEDUR® jet strips offer a combination of long service life plus the highest quality demands on finished textile products, throughout the entire lifetime of the jet strip.

The benefits of HyTec® GEBEDUR® jet strips are:

- ❖ Long service life due to reduced capillary edge wear.
- ❖ Improved resistance to damage and scratching during strip changes.
- ❖ Homogenous product properties over a long period.
- ❖ Jet strips resistant to external influences, e.g. damage from being hit, dropped or bent.

Groz-Beckert HyTec® GEBEDUR® jet strips have resistant surfaces in the region of the capillaries. The long service life resulting from this enables the manufacturer of spunlace products to achieve homogenous product features over a long period.

These products were also showcased the recent ITMA ASIA +CITME exhibition held at Shanghai in China. Further information can be obtained from Edelgard Keinath, Phone +49 7431 10-2762, e-mail: Edelgard.Keinath@groz-beckert.com.◆

Fine gauge fork needle for Random Velour.


HyTec GEBEDUR® Groz-Beckert jet strips with long service life.

Americhem to introduce line of custom colorants for nonwovens

Americhem Inc., a global provider of custom color and additive solutions for nonwoven fibers and films introduced its new range of custom color and additive masterbatches at IDEA 2010 held during April 2010. This new product line features superior dispersion technology resulting in lower pack pressure rise, fewer spin breaks and pack changes and higher yields. Because Americhem masterbatches promote uniform dispersion throughout the fiber, they significantly reduce the presence of aggregates and agglomerates, increasing pack life and spinning efficiency. Americhem's dispersion quality ensures unequaled fiber strength.

In addition to custom color, Americhem has enhanced its range of performance additives for the nonwoven sector. The company's additive portfolio now includes nDuramax™ UV stabilizers, antimicrobials, flame retardants, antioxidants and tracers for nonwovens. The company designs custom color and additive packages in a single masterbatch, or these additives can be designed as stand-alone products. Americhem will install its new custom-made spunbonded nonwoven pilot line at its plant in Dalton, Ga. The new capability will allow for faster product development and testing, reducing the amount of new product development conducted on customers' manufacturing equipment.

Chinese automotive sector shows considerable market growth

China auto textiles have been witnessing an annual progressive sales growth of 15% - 20% each year. Market demand kept increasing, while domestic supply is getting more and more inadequate.

According to China Textile Leader, Currently the consumption of China's auto textiles severely relies on imports with around $4 billion auto textiles imported each year. In the year 2010, fabrics used on auto seats reached 110 million m^2, auto carpets demand reached 23 million m^2, trunk linings reached 180 m^2, luggage rack textiles reached 7.6 million m^2, trim panel fabrics reached 8.1 million m^2, headliner reached 26 million m^2 and safety belt demand reached 91 million meters. The inadequate supply of auto textiles undoubtedly presents a vast development space for China's national textile industry.

Lenzing innovation in the field of protective fibers

A new idea coming from the established fiber Lenzing FR®, Lenzing is launched the fiber innovation Lenzing FR® BLACK for the first time at Techtextil North America. The Lenzing FR® fiber, with an incorporated black dyestuff, offers a host of advantages for both the textile industry and the wearer of protective clothing. Lenzing FR® BLACK is the first and only black, flame resistant textile cellulose fiber.

The unique advantages of Lenzing FR® BLACK stem from our proprietary processing which influences the tenacity of the yarn. With Lenzing FR® BLACK, the tenacity is retained which creates a longer service life of the textile. Moreover, for the wearer of black Lenzing FR® protective clothing, the high light fastness and fastness to perspiration prove to be a particular advantage. Extraordinary high quality is required in protective clothing since the apparel is often called upon to save lives. Additionally, Lenzing FR® BLACK has an important environmental advantage. Our unique coloring does not create waste water since the color is directly injected into the spinning mass. No flock or yarn dyeing is required.

The Lenzing FR® BLACK fiber innovation is used in various applications in industrial clothing – wherever long-lasting colors are in demand.

Lenzing FR® - brand fiber for protective clothing

Made from the natural raw material wood, Lenzing FR® offers protection from heat stress in a variety of different applications. Around the globe, Lenzing FR® sets the quality standard among cellulose fibers with incorporated flame resistance. Only Lenzing FR® is produced in the Lenzing Modal process thereby producing the highest fiber tenacities and allowing the incorporated protection to work in a permanent manner.

NSC Nonwoven: World reference in nonwoven systems supply

NSC nonwoven designs, builds and supplies turnkey nonwoven lines for needlepunching, spunlacing, thermobonding, air-through bonding and chemical bonding. The lines are equipped with a supervisory control assistance system, which includes production recipes, maintenance and assistance to line management.

NSC nonwoven is a worldwide, major supplier of Excelle® & Axcess cards, crosslappers, drafters, needlelooms, winders and slitters-rewinders.

NSC nonwoven speeds up its customers' innovations: It is time to reach performance product uniformity IsoProDyn®.

Over the last decade, innovations in crosslaid technology were concentrating exclusively on improved weight evenness.

IsoProDyn® not only further improves the capability of the famous Prodyn® system but also controls the characteristics in MD CD across the fabric width.

Direct benefits: potential fibre savings with lighter products and improved quality.

Customers benefits:

- ❖ enhanced strength uniformity.
- ❖ improved weight uniformity.
- ❖ added product value and performance.◆

Nsc nonwoven line.

EDANA 2009 nonwoven production statistics

EDANA, the international Association serving the nonwovens and related industries released its statistics on Nonwovens Production and Deliveries for 2009. The figures for Greater Europe (Western, Central and Eastern Europe, Turkey and CIS) show that as a result of the recent economic conditions, but also of the industry's effort to provide lighterweight nonwovens (using less material) with the same function, the production of nonwovens has contracted in weight by 6.3% since 2008, with 1,609,819 tonnes of nonwovens produced in 2009. This compares with the growth in the industry for 2008 of 1.2%.

After several years of double digit growth, the weight of nonwovens sold to the personal care wipes market declined in 2009, but sales remained stable in terms of surface area, with minimal growth recorded. While total production figures, by weight, have fallen, the level of production in square metres did continue to grow (nearly 51,000 million in 2009). According to a comparison of a select group of companies in 2008 and 2009, the average price of nonwovens remains nearly unchanged 2008 to 2009. The total turnover of the industry is estimated at around €4,790 million.

Jacques Prigneaux, EDANA's Market Analysis and Economic Affairs Director stated that "While trade flows for both exports and imports slowed in 2009, the EU27 trade balance of nonwovens roll goods was still highly positive, in both volume and in value. Moreover, for each subcategory of nonwovens, EU27 is still a net exporter. This positive trade balance helped contain the unfavourable trade balance of the overall European textile industry."

The most significant decrease in tonnage has been recorded in polymer-based (spunmelt) nonwovens. In addition, despite a small decrease of nearly 2% of nonwoven deliveries (in tonnes) to the hygiene business, this segment remains by far the largest outlet of the industry and increased its market share both in weight and surface area in 2009.

After several years of double digit growth, the amount of nonwovens sold to the personal care wipes market declined in 2009, but sales remained stable with minimal growth recorded.

While the largest contractions were observed in civil engineering, home furnishing, industrial wipes and automotive, medical applications recorded notable positive development.◆

Global demand for carbon fibres in cars set to reach 8.5 million tons by 2015

Global demand for carbon fibres in the production of cars and other light vehicles is set to reach 8.5 million tons by 2015, according to a new report by Textiles Intelligence. This prediction is based on the assumption that each new car will have just 100 kg of carbon fibres on average, but the actual potential market could be much greater as fibre prices come down with rising volumes.

Carbon fibre is a material consisting of extremely thin fibres with a diameter of around 0.005 0.010 mm. It is used as the reinforcing material in carbon fibre reinforced plastic (CFRP), which forms the basis of carbon fibre parts currently used in aircraft, sports equipment and racing cars.

Its high strength to weight ratio makes it ideal in aircraft, where the imperative in an era of heightened eco-awareness is to reduce weight and hence fuel consumption. In sports equipment and racing cars the emphasis is on performance. In aircraft, the use of carbon fibre has grown rapidly in recent years as the basis for composite parts. Twenty years ago it accounted for only 10% of an aircraft body. But in the latest superplanes notably the Airbus A380 and the Boeing 787 Dreamliner it has a share of over 50%.

Carbon fibre is also being used more than ever before by the aircraft used by the US military as well as in many other items of military equipment.

The next major phase of development for carbon fibre composites will be in vehicles and electric ones in particular as the need to reduce pollution and find an eco-friendly alternative to fossil fuels becomes ever more pressing. Carbon fibre is ideal because of its high strength to weight ratio and the need to reduce the weight of the car in order to increase the distance which the vehicle can be driven before its batteries need to be recharged.

To take advantage of the market potential, several companies have formed joint ventures and more are expected to follow. In one development, plans have been announced by a joint venture between SGL Group and the automotive manufacturer BMW to invest US$100 million in the construction of a new carbon fibre manufacturing plant at Moses Lake, Washington, USA.

Initially, fibres manufactured at the facility will be used exclusively for BMW's Megacity - a new electric vehicle which will be assembled in Leipzig, Germany, and launched before 2015 under a BMW sub brand.

In its use of CFRP components, BMW is furthering a concept which it calls "sustainable mobility" by using a lightweight construction it will dramatically reduce fuel consumption and minimize CO_2 emissions.

In a parallel development, the German company Daimler and the Japanese company Toray Industries announced in April 2010 that they planned to start joint development of carbon fibre car parts in 2012 for use in Mercedes Benz cars.

The parts will be made from carbon fibre composite materials manufactured at Toray's plant in France. The new materials will be used in the Mercedes Benz SL Class, making this vehicle the first mass produced passenger car to include carbon fibre made by Toray.

Zoltek a leading carbon fibre manufacturer based in the USA formed a new subsidiary called Zoltek Automotive to speed up the development of high volume applications for lightweight carbon fibres within the automotive industry.

Zoltek's chairman and chief executive officer (CEO), Zsolt Rumy, said that the company had long identified the automotive industry as the biggest single potential user of the company's low cost, high performance carbon fibres.

According to Zoltek Automotive's CEO, David Stewart, "the value proposition and regulatory environment for carbon fibre automotive components have never been better. There is a large and rapidly growing range of applications where these materials are ready to come out of the laboratory and [go] into high volume production.

Executives at the Japanese company Teijin, another company to enter the market, believe that the use of carbon fibre reinforced plastic (CFRP) will cut the weight of electric vehicles by more than half within a few years.

In March 2010 the company unveiled a super lightweight electric concept car made with proprietary materials and technologies – including polycarbonate resins and bio derived polyester as well as carbon fibre composites.

The car, known as PU_PA EV as in "pupa electric vehicle", a reference to metamorphosis weighs only 437 kg and embodies Teijin's vision of what a vehicle on the market in five to ten years' time will look like.

"Carbon Fibre in Cars: Concept or Future Megamarket" was published by Textiles Intelligence in issue No 80 of Technical Textile Markets.

Dilo presents DI-LOUR and DI-LOOP

As the inventor of the well established needle felt structuring and patterning machines DI-LOUR and DI-LOOP the DiloGroup covers products made on their advanced production lines and needling machinery.

With the lines and needling machinery of DiloGroup a wide range of floor covering products can be manufactured economically: e.g. needled floor covering, backing for tufted carpets, sport surfaces or synthetic lawns and door mats. In addition DI-LOUR and DI-LOOP machines allow surfaces like velour, corduroy and structured while offering many other design possibilities.

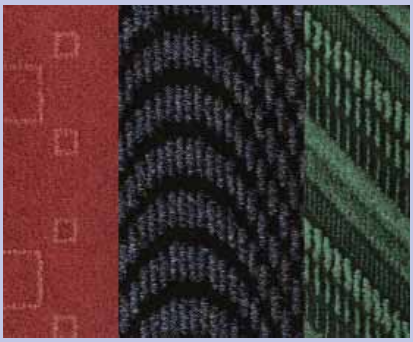
Rib, velour and patterned needle felts can be durable floor coverings. These felts are produced at the best cost-value-relationship by means of DI-LOOP needling machines.

Applications may be carpets, door mats and sport surfaces but the range of applications exceeds floor covering and includes e.g. automotive interior linings and wall coverings. This shows the flexible potential of the DI-LOOP machine.

Random needle felt velour is an interesting product because of its excellent cost value ratio. Again, applications in the field of floor covering are carpets, door mats and sport surfaces. Major applications are also in the field of automotive, wall covering, plush for toys, shoe and jacket linings. DI-LOUR machines produce random needle felt velour with optimum performance.

The Dilo advanced patterning allows many different designs such as coloured patterns with diamonds and cross lines.◆

DI-LOUR samples.



DI-LOOP floor covering designs.

Exxonmobil Chemical's Vistamaxx™ Propylene-based elastomers add value to flexible films

ExxonMobil Chemical's Vistamaxx™ propylene-based elastomers create new opportunities for customers to add value to their flexible film applications across the value chain. Film manufacturers and end users are discovering that the combination of benefits offered by Vistamaxx provides a new level of performance potential.

Enhanced sealability, improved adhesion, inherent elasticity, notable toughness and broad polyolefin compatibility delivered by Vistamaxx are inspiring innovation and product development in a wide range of flexible film applications. These include cast polypropylene (cPP), stretch hood, PP raffia tape, extrusion coated and laminated woven and nonwoven polyolefinic substrates, surface protection, cast stretch, and elastic hygiene film. High transparency film applications also benefit from the good optical properties and chemical resistance of Vistamaxx.

The complete combination of benefits allows film manufacturers and end user customers to design films with new levels of performance, lower formulation and processing costs, and achieve sustainability objectives with lower energy usage, reduced material consumption and, as Vistamaxx is a polyolefin, recyclability.

Now four new grades, Vistamaxx 6202FL, Vistamaxx 6102FL, Vistamaxx 3980FL and Vistamaxx 3020FL, have recently been introduced for high performance film applications. The FL series of Vistamaxx grades exhibits a low gel count, provides processing and performance improvements, and protects investment in film aesthetics, offering film formulators, converters and end-users inspiring new options for next generation film designs. These options include: excellent sealing operation and package integrity; improved film tear resistance at high stretch ratios; and, improvements in scratch and indent-free surface protection.

This series of Vistamaxx FL low gel grades can result in higher printing and optical quality and, as with all Vistamaxx grades offered to the film market, complies with the U.S. Food and Drug Administration (FDA) and European Union (EU)-Directive for use in contact with food. Vistamaxx propylene-based elastomers have been developed to enable converters and manufacturers to specifically tailor the properties of mono- or multi-layer films to meet customer needs.

Coatema presents new Minicoater

The new unit called Minicoater includes different options of coating and printing systems, like doctor blade, slot die, impregnation, micro roller and engraved roller printing and a laminating device. With a working width of 100 mm the ink consumption can be minimized for the R&D process.

Further the Coatema Minicoater is equipped with a 350 mm hot air dryer in EEx-layout. A laminating station provides the possibility to include encapsulation processes in the operation. Reproducibility is possible without any compromises. The multifunctional unit is equipped with 3-4 motors, load cells and a backward running operation mode. Those features make small sample production an easy operation. The whole unit is enclosed and can also be offered for glove box operations

Inputs for bullet-proof jackets gets customs and excise relief

The government of India has exempted a special type of yarn used in the manufacturing of bullet-proof jackets from payment of excise and customs duty. This exemption will be applicable for supplies made to the armed and police forces.

Producers of bullet-proof jackets have also received exemption on purchase of ballistic grade aramid fabric used in the production of these jackets from payment of excise duty, which already enjoys exemption of customs duty, again for supplies to police and armed forces.

This move of the Central Board of Excise and Customs under the Finance Ministry will help save 26.85% on ballistic grade aramid yarn on customs duty alone and 10.30% on excise duty.

Bekaert: SiroLock® Technology

Bekaert is active in more than 120 countries and has more than 22,000 employees worldwide to guarantee a prompt and customised service.

The inventor of SiroLock®, Ken Atkinson of CSIRO (Commonwealth Scientific and Industrial Research Organization – Australia) said, "SiroLock® is a totally new concept in metallic wire. The step in the wire is increasing the retention of fibres and the carding action. Industrial application of SiroLock® has shown multiple benefits and value on roller cards, in worsted, woollen as well as in nonwoven applications"

SiroLock® increases the coefficient of transfer compared to conventional card wire, therefore, fibres are controlled and held under the step

CSIRO: SiroLock® is a trademark owned by CSIRO and registered in Australia, the European Union and the USA. Bekaert has an exclusive license to manufacture and market the SiroLock® wire, as the SiroLock® wire can catch up to 40-50% more fibres. SiroLock® is available in five different versions covering a wide range of applications

- L10/100 SiroLock® for the worsted industry (top making).
- VH16/360/55 SiroLock® for heavier web nonwovens - for the breaker card.
- VH20/360/55 SiroLock® for heavier web nonwovens.
- VL24/360/55 SiroLock® for nonwoven applications.
- VF28/250/50 SiroLock® for light weight webs.

Industry related benefits - nonwoven

- Increased production, through increased delivery speed; and/or heavier web weight.
- Improved web uniformity.
- Reduced fibre consumption and waste.
- Reduced nep formation,
- A wider range of web weights with same SiroLock® wire type

Value for customer

- Higher throughput and/or quality depending on the final use of the web.
- Fast payback through increased output and improved and more uniform web quality. ◆

Mr. Ken Atkinson, Researcher with CSIRO and inventor of SiroLock®

CSIRO relies on Bekaert's technological expertise to develop a revolutionary new card design.

"SiroLock® is a totally new concept in the carding industry. The step in the wire is increasing the retention of fibres and the carding action. Thanks to Bekaert's commitment and teechnical expertise we were able to develop the idea into an industrial product."

Fibertect Absorbent could aid gulf coast oil disaster clean-up

Fibertect, a three-layer flexible, inert, nonwoven, non-particulate decontamination system that has been proven to be successful in absorbing and adsorbing chemical warfare agents, may now prove useful in recovery efforts in the British Petroleum (BP) Deepwater Horizon disaster and other oil spills of similar size and severity. Fibertect was developed by Texas Tech University's The Institute of Environmental and Human Health (TIEHH) Associate Professor Seshadri Ramkumar and is manufactured by Hobbs Bonded Fibers for First Line Technology.

The three layers of material consist of a top and bottom fabric with a center layer of fibrous activated carbon that is needle punched into a composite fabric. The top and bottom layers provide structural coherence, improving mechanical strength and abrasion resistance while the center layer holds volatile compounds, like oil. Ramkumar said according to documented research published by many scientists, raw cotton can absorb up to 20 times its weight. But when chemically modified the material can hold more than two to three times that amount. And unlike synthetic materials like polypropylene that are currently used in many oil containment booms, Fibertect made from raw cotton and carbon is biodegradable.

According to BP, the U.S. Coast Guard and the National Oceanic and Atmospheric Administration (NOAA), the spill is leaking about 5,000 barrels a day, but some researchers are claiming the disaster could prove even more dramatic. It began April 20 after an explosion and fire aboard the semi-submersible drilling rig in the Gulf off the coast of Louisiana. Some of BP's first attempts at clean-up were not successful and as the British oil giant struggles to collect oil from the leak, First Line has submitted information on the Fibertect technology as an alternate response technology.

A preliminary test of Fibertect® on the soiled beaches of Grand Isle, La., has proven it successful at picking up the oily paste washing ashore at beaches and marshes across the Gulf State region. Not only did it clean up the rust-colored crude oil, but also it adsorbed toxic polycyclic aromatic hydrocarbon vapors reportedly sickening oil spill clean-up crew members.

"It definitely has proven itself a perfect product for cleaning up the oil spill," Ramkumar said. "This preliminary test in Louisiana has shown that our wipe material is unique from others in that it easily absorbs liquids, and it has vapor-holding capacity. This will help workers clean beaches and stay safe at the same time."

Ramkumar said his latest research shows raw cotton-carbon Fibertect® can absorb oil up to 15 times its weight. Unlike synthetic materials like polypropylene that are currently used in many oil containment booms, Fibertect® is made from environmentally friendly raw cotton and carbon.

Amit Kapoor is president of First Line Technology, which distributes Fibertect® commercially. Though the product has been tested in the lab with raw crude and motor oil, he said the company wanted to field-test the product. The product is manufactured by Hobbs Bonded Fibers, Waco, USA.

Earlier a sales representative, who also works as an independent contractor for BP, went to one of the worst-hit areas. "We wanted to test the effectiveness of Fibertect® on the crude oil for beach cleanup," Kapoor said. "Fibertect® was taken to the empty beaches of Grand Isle, and then laid out on top of a blob of oil that had settled on the beach. It worked very well in absorbing and containing the oil. The glob stuck to the Fibertect® and did not release from the material."

Though Kapoor said he had seen Fibertect® pick up similar material with a pasty consistency, such as petroleum jelly, the results shocked the sales representative sent to run the experiment. "Our representative was shocked because he hadn't seen a product work like that with the speed or the effectiveness," Kapoor concluded.

Fibertect® was approved for use as a sorbent by the U.S. Environmental Protection Agency, Ramkumar said. The product already has proven that it can also adsorb toxic fumes associated with chemical remediation, he said. Evaluation by Lawrence Livermore National Laboratory found that it can retain offgassing mustard vapors efficiently and does not shed loose particles.

"Fibertect® already has proven to be effective in the bulk decontamination of chemical warfare agents and toxic industrial chemicals, but our proposal here is to use it to aid in the clean-up efforts in the Gulf," Kapoor said. "Fibertect® allows for a green, environmentally safe, biodegradable technology that is perfect for the expanding effort to protect and decontaminate coastal lands and wildlife. We welcome the opportunity to work with the government, BP or anyone else in a joint effort to defend and preserve our planet."◆

Oilguard - New nonwoven technology to protect beaches from oil spills

A new nonwoven fabric for beach protection against oil spills has been developed which can be deployed as a short-term alternative in large quantities to affected US coastal regions. The current oil spill in the Gulf of Mexico is causing major damage to the open waters and coastal regions. This acute problem will at the very least persist for several months.

Given the magnitude of the oil release, no existing technique alone is able to grant full protection against the oil which will eventually end up on beaches, rocks and land. Once oil is on land the contamination can be severe, and the cost and effort associated with the cleanup tremendous.

The vast coastal eco-system impact of the oil-spill was the driving force for **HeiQ Materials AG** - a Swiss high-performance textile effects company and **TWE - a world leading German manufacturer of nonwoven fabrics**, to develop, produce and launch an oil absorbing nonwoven fabric called Oilguard. Rolled out on beaches, Oilguard specifically contributes to the beach protection due to its built-in capability to absorb oil while repelling water at the same time.

"Based on our previous product development work on super hydrophobic technologies for textiles, we have a unique know-how and understanding which we have now been able to rapidly turn into a product, Oilguard, that can play a role in helping to mitigate the serious problem in the Gulf of Mexico", says Carlo Centonze, CEO of HeiQ.

Oilguard was developed by HeiQ under extreme time constraints in a joint effort with Swiss partner company, **Beyond Surface Technologies**, and the TWE Group in Germany. The Oilguard nonwoven fabric can be up to 6 yards wide and hundreds of yards long. The companies' current production capacity corresponds to 20 miles of new beach protection every day.

"We are in the unique position that we are set-up to deliver large quantities of the Oilguard nonwoven fabric in virtually no time to any region in need for it" says Jörg Ortmeier, CEO of TWE. "Currently we are in the process of organizing live testing in collaboration with US authorities and will then be able to rapidly contribute to help mitigate the oil contamination of the coastline."

Carlo Centonze explains: "We have received significant interest and support from US federal and political channels and we also seek to engage state authorities, local groups and NGOs to participate in this challenging beach rescue project."

Further information: www.oilguard.org.