

# WELCOME BACK – AGAIN

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Co-editor, *International Nonwovens Journal*

Suddenly, it is five years since we re-launched the International Nonwovens Journal – time does fly!

There have certainly been some changes over these five years – we believe for the better:

- The publication frequency doubled to four times a year.
- INJ moved to an exclusively electronic publication format, allowing the liberal use of color in each issue.

• Subscriptions were dropped, making INJ access free to anyone around the world.

Along the way, the INJ Mission was developed with the help of the INDA Technical Advisory Board: To publish the best peer reviewed research journal with broad appeal to the global nonwovens community that stimulates and fosters the advancement of nonwoven technology.

One thing that has not changed - the editors are constantly looking for input and suggestions – we continue to look forward to hearing from you. Our purposes have remained relatively constant, so, we felt that it would be a good idea to re-examine these purposes as laid out in our first editorial – with pertinent portions copied below. Again, if you have any thoughts, let us hear from you. – *INJ*

### FIVE YEARS AGO THIS MONTH ...

Welcome to the first issue of the newly re-launched International Nonwovens Journal (INJ). We sincerely hope you will find INJ useful; and, in fact, we hope that you find it was sorely missed since last published in 1995. There are certainly a number of questions on the minds of many readers and we will endeavor to briefly answer some of them in this editorial:

- Why is INJ being re-launched?
- What is its main purpose?
- How did we get here?
- What is different and what does the future hold?
- If this is so great, how can I help?

Simply stated INJ is being relaunched because there was an unmet need. As the nonwovens industry, or any other industry for that matter, matures, mechanisms are needed that maintain the long term health of the industry. One such mechanism is the support and encouragement of basic and applied research, both industrial and academic. Such research not only pushes the state of the art, but also simultaneously develops the human resources necessary to regenerate and expand the industry. The nonwovens industry was already blessed with an outstanding trade press; and, additionally, there are numerous journals in allied industries. However, there is no other peer reviewed journal that focuses exclusively on the nonwovens industry. Further, as we all know, peer reviewed articles are near and dear to academicians who are constantly challenged: AWhat have you published lately?@.

It has often been observed that research, especially academ-

ic research, tends to be encouraged in areas where there are appropriate journals for publication. It is also important to note that often these authors are the same people who are also busy educating new scientists and engineers for industry. Therefore, the key purpose for INJ is to provide the necessary vehicle for refereed publication of important work in the field of nonwovens.

While we would like to be able to take credit for the decision to relaunch INJ, this honor of foresight belongs to the President of INDA, Mr. Ted Wirtz, and the INDA Staff who were among the first to see the need INJ fills. Acting on this insight, INDA made the decision to financially support the relaunch of the journal while simultaneously inviting nonwovens associations from around the world to participate. The simultaneous nature of these actions allowed a rapid relaunch of INJ while the cooperative gears of various associations were turning. . . . TAPPI, in fact, has decided to discontinue publication of nonwovens papers in TAPPI JOURNAL and this issue of INJ has several papers originally submitted to TAPPI for publication. . . .

As for what the future holds . . . well, this will in large part be up to you, the reader. Your editors want to optimize the value of INJ and sincerely believe that this will best result from cooperation with the INJ audience. We will individually be seeking your input as opportunities arise, and we would like to hear from you: suggestions, areas for improvement, submissions of papers for review, and contributions to departments such as Director=s Corner, Researcher=s Toolbox and Emerging Technology Watch.

*Rob Johnson, D.K. Smith*

# WORLDWIDE ABSTRACTS AND REVIEWS

*A sampling of Nonwovens Abstracts from Pira International — A unique intelligence service for the nonwovens industry*

## **Cotton fibre prevents skin irritation**

Daiwabo Rayon Co Ltd, Osaka, Japan, manufacture a cotton fibre which is said to prevent skin irritation from substances such as residual detergents and softeners. The cotton fibre is treated with a phospholipid polymer which traps these residual compounds and prevent them being in contact with the skin. By the spring/summer of 2004 the material should be available to buy. It will cost about 10% more than the usual cotton fabric and will be useful for men's shirts, women's underclothes, and uniforms. (Short article)

*Author: Anon*

*Source: New Mater. Jpn*

*Issue: Oct. 2003, p. 12*

## **Chemistry hopes for recovery: Germany**

The German chemical industry is looking for an export led recovery in the second half of 2003. Higher prices are expected to lead to a 2.5% increase in turnover. In the chemical fibre sector Neumag GmbH has supplied at least 11 large capacity polyester staple fibre plants to the Far East recently, and its US subsidiary Ason Neumag is supplying a spunbonded fibre plant to General Tekstil in Turkey. German chemical fibre production has decreased 14% to 936,000t since 1992. In 2002 polyester accounted for 38% and polyacrylate for 25% of synthetic fibre output. A Saurer Group study estimates global nonwovens production reached 6mt in 2002, equivalent to more than 100bn sq m. Drylaid is the most widely used tech-

nology, followed by meltspun, airlaid and wetlaid. In 2000 spunbonded production exceeded 1mt, with 75% of this tonnage based on polypropylene. Output of airlaid and wetlaid nonwovens totalled approximately 0.4mt. Driven by rapid growth in China, Asian nonwovens production is now close to that of Western Europe and North America. China, Japan, South Korea and Taiwan are the largest Asian producer countries. (7 fig, 1 tab)

*Author: Anon*

*Source: Allg. Vliesstoff-Rep.*

*Issue: no. 5, 2003, pp 26, 28-29 (In German)*

## **Waterjet bonding of film fibre nonwovens**

Spunlace technology using high pressure water jets has been adapted by the Saxony Textile Research Institute in Chemnitz, Germany, to produce nonwovens from splittable fibres and films. Water jet treatment will cause fibrillated polymer films to form net-like structures containing bonded fibres. The structure and fineness of the nonwovens can be controlled by varying the water pressure, the number of jets and their geometry, and that of the supporting sieve. High pressures were found to result in better film fibre splitting as well as better bonding. Medium strength, high density nonwovens produced by this method show little stretching. Potential applications include geotextile components and products for the construction industry. The degree of fibrillation was also

shown to determine the oil absorbing capacity, suggesting applications as oil absorbent mats. The process has been patented jointly with Fleissner Maschinenfabrik GmbH. (2 fig)

*Author: Brodtka M*

*Source: Allg. Vliesstoff-Rep.*

*Issue: no. 5, 2003, pp 44-45 (In German)*

## **Shape retaining fibre for nonwovens, PR-UK from Ube Nitto Kagaku KK**

PR-UK fibre, developed by Ube Nitto Kagaku KK, Japan, is a heat adhesive composite fibre composed of a polypropylene (PP) core and a low melting point PP outer layer. It has good size stability against heat and is suitable for through air modification. PR-UK has high elasticity and nonwovens made from it possess good shape retention and similar recovery after pressing to polyethylene terephthalate (PET heat adhesive fibres. Applications of PR-UK include the backing sheet for sanitary towels, cushioning materials, wipes and filters. PR-UK has an improved heat seal performance compared to conventional PP fibres, and can be applied to the heat sealing of polyolefin nonwovens and films. PR-UK staple fibre and short cut fibre are available for a wide range of nonwoven manufacturing techniques.

*Author: Hayashi S*

*Source: Jpn Nonwovens Rep.*

*Issue: no. 8, Aug. 2003, pp 10-11 (In Japanese)*

## **Functional fibres for nonwovens and papers from Daiwabo Polytech KK**

Daiwabo Polytech KK supplies a wide range of functional fibres including anti-slip composite fibres, available in heat adhesive, heat resistant and extra wide forms, halogen- and phosphorus-free flame retardant polypropylene (PP) fibres, high and low crystallised PP-based fibre. Polyethylene terephthalate fibres are available with good heat adhesive performance and bulkiness, and PP/polyethylene adhesive fibres with various densities. Heat adhesive fibres are resistant to biodegradation and heat press adhesive fibres are made from polymethyl penthene. Composite

nonwovens with high mechanical strength can be used in the manufacture of filter products without support materials. Shredded fibres are mainly used in the manufacture of electric materials. (5 fig, 3 tab)

Author: Takai Y

Source: *Jpn Nonwovens Rep.*

Issue: no. 8, Aug. 2003, pp 12-15 (In Japanese)

### **Polylactic acid fibre Teramac, a new biodegradable fibre from Unitika Fiber KK**

Teramac, developed by Unitika Fiber KK, is a biodegradable fibre made from poly lactic acid (PLA) from natural raw materials such as corn. Teramac has better water absorption than polyethylene terephthalate, is mildly anti-bacterial, has flame retardant properties which meet Japanese Industrial Standard (JIS) K7210 and is resistant to light degradation. As Teramac is biodegradable, it is widely applied to disposable products in the food, sanitary, medical, agricultural, gardening and construction industries. It is also used for textile, domestic goods and interiors due to its water absorption, antibacterial, flame retardant and head adhesive properties. Developments to improve the durability and flame retardance of Teramac are continuing. (8 fig, 2 tab)

Author: Yamada F

Source: *Jpn Nonwovens Rep.*

Issue: no. 8, Aug. 2003, pp 16-18 (In Japanese)

### **Highly functional fibres from Toray KK, Toyoflon, Teflon and Torucon**

Toray KK has the largest share in the world market for Toyoflon/Teflon and Torucon/Ryton, after purchasing Teflon and Ryton from DuPont and American Fibers and Yarns Co, respectively. All fibres have a good insulation performance and superb resistance against chemicals, heat, flame, high temperature steam and weather. Tefyer HG felt contains 50% glass fibres and is suitable as a microbial filter. Torucon Bung Filter is resistant to oxides of nitrogen and sulphur at 140-170 deg C, and is useful in

increasing the efficiency of coal boilers. Applications on office machines and vehicular parts, based on non stick and low friction properties are also common. Developments for textile and electrical equipment applications are also continuing. (2 fig, 2 tab)

Author: Anon

Source: *Jpn Nonwovens Rep.*

Issue: no. 8, Aug. 2003, pp 19-22 (In Japanese)

### **Kanebo Gosen KK Lactoron, plant origin polylactic acid fibre**

Lactoron, developed by Kanebo Gosen KK, Japan, is a polylactic acid (PLA) fibre made from corn starch. It is environmentally friendly because of its biodegradability and low energy consumption for incineration disposal without generating toxic gases. Its melting point is the highest among biodegradable fibres, and it also possesses high clarity and excellent mechanical strength. Lactoron can be made into nonwovens by spunbonding, needlepunching and spunlace and is used for a wide range of products, including construction, building, agricultural, domestic goods, interior and textiles. Products made from Lactoron are skin friendly, lightweight, soft texture with rapid absorption and drying of perspiration and mild antibacterial performance. It has been successfully combined with other natural fibres such as cotton in the manufacture of textiles. (3 fig, 1 tab)

Author: Honmochi K

Source: *Jpn Nonwovens Rep.*

Issue: no. 8, Aug. 2003, pp 23-25 (In Japanese)

### **Teijin KK starts a new production line for Morphotex, a morpho fibre that develops various colour by light interference**

Teijin KK is starting production of Morphotex, a photochromic fibre, at a new plant in Matsuyama, Japan. Morphotex is the result of 7y of collaborative research with Tanaka Kinzoku Kogyo KK. Nissan KK is showing an interest in Morphotex for an application

on car body coating. (Short article)

Author: Anon

Source: *Jpn Nonwovens Rep.*

Issue: no. 8, Aug. 2003, p. 45 (In Japanese)

### **Daiwabo KK's composite formed net Tanglet, popular for roof gardening**

Tanglet, a polypropylene based three dimensional net developed by Daiwabo KK, Japan, is becoming a popular material for roof gardening. Tanglet is a pressure resistant and flexible nonwoven product, and possesses an excellent drainage performance. New composite types, combined with metal nets and other types of nonwovens, are attracting attentions in various industries. (Short article)

Author: Anon

Source: *Jpn Nonwovens Rep.*

Issue: no. 8, Aug. 2003, p. 46 (In Japanese)

### **Daikin KK developed a photo catalytic Titan Apatite Filter, 2.5 times improved bacteria adsorption capacity**

Daikin KK, Japan, has successfully applied photocatalytic apatite titanium oxide technology to filter products. The technology was developed by Professor Watanabe of the University of Tokyo and Fujitsu Kenkyusho, and the first commercial application was made on an air filter launched in August 2003. This filter shows 2.5 times improved adsorption for bacteria. It also produces active oxygen by absorbing ultraviolet (UV) light, and degrades organic compounds released by viruses and bacteria. (Short article)

Author: Anon

Source: *Jpn Nonwovens Rep.*

Issue: no. 8, Aug. 2003, p. 46 (In Japanese)

### **Nonwoven filter for oil and odour removal from Kanai Jyuyo Kogyo KK, Greentech KK and Daikyo Kigyo KK**

Kanai Jyuyo Kogyo KK, Greentech KK and Daikyo Kigyo KK, all Japan, have developed a oil and odour removal system, composed of a nonwoven prefilter and a active carbon filter. The removal of oily vapour and odour is approximately 100% and 30%, respectively. Three types are available from

JPY200,000. Taniko KK, a leading industrial kitchen product company, contracted to manufacture this new filter product. The main application is for extractors in the non domestic kitchens, and the target market is the small sized restaurants. (Short article)

*Author: Anon*

*Source: Jpn Nonwovens Rep.*

*Issue: no. 8, Aug. 2003, p. 47 (In Japanese)*

## **Automotive air filters: market and technology trends**

A Filter Media Consulting Inc report, covering new nonwoven filter product developments including cellulose/melt-blown composites, Donaldson's PowerCore, new specialised needle felts and other materials predicts that market is forecast to reach an estimated USD80m-85m by 2007. While synthetic filter materials are more expensive than cellulose and paper based products they are expected to gain market share due to their longer service life, greater particle loading capacity, lower moisture absorbency and higher temperature tolerance. New air filter products based on nanofibre technology are expected to be developed over the next five to ten years. (Short article)

*Author: Bergmann L*

*Source: Allg. Vliesstoff-Rep.*

*Issue: no. 5, 2003, p. 7 (In German)*

## **Belgium: 70% share for exports of textiles**

Exports accounted for 70% of the Belgian textile industry's Euro6.6bn turnover, not including clothing, in 2002. Technical textiles generated Euro2bn sales, with 65% from exports. The sector covers some 140 companies producing materials for geotextile, construction, agricultural and horticultural, defence and security, as well as automotive, medical, filtration and packaging applications. Flemish producers include Lys-Fabrics, the Steverlynck Group, Bekintex, Vetex and Concordia Textiles NV, each with a wide product range, as well as Sanox specialising in hygiene products. Bonar Technical Fibres, based in Zele, produces heat bonded and nee-

dled speciality products based on polypropylene, polyethylene and polyester fibre. Recent developments include Procotex's needled flax/polypropylene felt made in a 400-2,200gsm substance range for automotive interiors, offering lighter weight, higher strength and environmental advantages compared with existing products. (2 tab)

*Author: Anon*

*Source: Allg. Vliesstoff-Rep.*

*Issue: no. 5, 2003, pp 9-12*

## **France: global presence in textiles**

Nonwovens production equipment accounted for 10.3% of the French textile machinery industry's Euro850m turnover in 2002. Exports to other European countries, Asia and Turkey represented 44.36%, 28.37% and 10.20% of sales respectively, with 9.25% for sales to North America. Laroche's latest generation Airlay fabric machinery produces up to 3,900mm wide webs in substances in the 300-4,000gsm range. The new machines can handle all types of fibre including recycled and natural fibres, speciality glass, silicate, carbon and aramid fibres as well as feathers. The Airlay section features x ray or weigh scale fibre flow control and automatic air flow control to ensure even grammage. The Airlay 2400's production capacity ranges up to 2,000kg/hr depending on width and product specification. Figures show the top 15 export countries for French textile machinery, breakdown of sales of French textile machinery by sector and export destinations of French textile machinery by region. (3 fig)

*Author: Genevray H*

*Source: Allg. Vliesstoff-Rep.*

*Issue: no. 5, 2003, pp 12-14*

## **New opportunities for flax, hemp and sisal**

Papers presented at the 4th International Symposium on Materials from Sustainable Resources, Erfurt, Germany, covered new research into fibre composites; starch, protein and lipid based materials; ecological struc-

tures based on sustainable raw materials; and new materials based on cellulose and its derivatives. According to the Reutlingen Institute for Applied Research, German production of raffia fibre has declined in the face of cheaper imported short fibre materials. Kassel University's Institute for Materials Technology reports growing interest in the use of wood and other natural fibre to reinforce synthetic polymer fibres in automotive and furniture applications. Budapest University is investigating the properties of sisal-reinforced polypropylene felts. The Saxon Textile Research Institute is developing biodegradable spunbonded fabrics based on polylactides. Air suction techniques used for spunbonded polypropylene and polyester fabrics were found to require modification, and physical properties of biodegradable nonwovens differ from those made from conventional fibres. Procter and Gamble's Nodex biodegradable aliphatic copolymers are based on polyhydroxyalkanoate made from renewable resources. Their structure and properties are similar to those of linear low density polyethylene (LLDPE) and the materials can be used to produce films, fibres, nonwovens and foamed products.

*Author: Anon*

*Source: Allg. Vliesstoff-Rep.*

*Issue: no. 5, 2003, pp 24-25 (In German)*

## **New materials: from the gap between the elements**

Frenzelit-Werke GmbH, Germany, has introduced a range of high performance nonwoven products for different technical applications. The company's Bad Berneck, Germany, plant's hicoTEC fabrics are made from high performance fibres such as carbon, aramid, polyetherether ketone (PEEK) and polyphenylene sulphide (PPS), using a modified forming technology. The composition and structure of the resulting products makes these intermediate between technical nonwoven textiles and high performance papers. Properties such as stiffness and hard-

ness, electrical conductivity, thermoformability and absorption capacity can be tailored to meet specific requirements. The range comprises hicoCELL carbon fibre products, hicoSORB filter media, hicoSHIELD protection from electromagnetic radiation, and hicoJECT products for conversion by injection moulding, with hicoDUR and hicoSEAL composite films for use in seals and bearings. The products are supplied in up to 610mm wide, 1.10m diameter rolls in substances ranging from 8gsm to 400gsm depending on the base material used. (2 fig)

*Author: Anon*

*Source: Allg. Vliesstoff-Rep.*

*Issue: no. 5, 2003, pp 36, 38 (In German)*

### **Textiles for vehicle interiors: the use of potentially recyclable nonwovens**

Textile applications in the automotive sector range from rear shelves and seat cushions to cable wraps and account for approximately 3% of the overall mass of the vehicle. Cost effective bulky, elastic nonwovens that can also be revalorised offer potential applications, especially for car seats and interior linings. Such developments would contribute to the recyclability of used vehicles. Several bonding techniques are available, enabling up to 12mm thick fibre structures to be created. Kunit and Multiknit nonwovens can be used to produce seat cushions having the required elasticity, air porosity and insulating properties, using low melt point bonding fibres. New nonwovens developed jointly by the Saxon Textile Research Institute (STFI) and TECHTEX Vliesstoffe GmbH for such applications are being evaluated by Seat, Skoda and Audi.

*Author: Hunger M; Bottcher P; Schimanz B*

*Source: Allg. Vliesstoff-Rep.*

*Issue: no. 5, 2003, pp 39-40 (In German)*

### **New products made using well known processes**

Needling can replace sewing to produce geotextile tubing used to sheath plastic drainage pipes. The tubes provide protection for the pipes and allows the dug

channel width to be reduced. Needling is also used to improve the shear resistance and surface integrity on nonwovens and other textiles. It is particularly suitable for use with three dimensional structures such as Kunit and Struto in applications in which polyurethane foam substitutes are used to replace cushioning in car interiors. Thermobonding is widely used to combine bonding fibres with fabrics by heat and pressure. The bonding material can be based on plain or adhesive coated nonwovens or films and can be roll-fed to deliver bonding strips across the textile surface. The method allows pile surfaces to be applied to nonwoven textiles.

*Author: Bottcher P*

*Source: Allg. Vliesstoff-Rep.*

*Issue: no. 5, 2003, pp 42-44 (In German)*

### **Fleissner: new developments for the nonwovens industry**

Maschinenfabrik Fleissner's AquaJet-Spunlace hydroentanglement equipment is now built in widths up to 7,000mm. The system allows nonwovens based on hemp and sisal to be produced for automotive and household applications in substances up to 1,500gsm. The technique is used to produce cotton wool pads, cotton wipes and cotton/synthetic nonwovens. The patented AquaPulp system combines spunlace and airlaid technologies to produce two- and three-layer composite materials in which properties such as bulk, softness and absorbency can be optimised. New technologies integrated into the AquaJet-Spunlace system allow the cross machine strength of carded or spunbonded nonwovens to be increased, and a more homogeneous surface to be provided. The AquaSpun system combines spunbonded and spunlace technologies to produce 6m wide materials from homopolymer or split fibres at up to 500-600m/min. A new water filtration system allows spunlace equipment to operate without generating effluent.

*Source: Allg. Vliesstoff-Rep.*

*Issue: no. 5, 2003, pp 52-55 (In German)*

### **Worldwide market trends for nonwovens**

Global production of nonwovens continues to increase at a rate of 4%-7%/y. Nonwoven trade fairs continue to see an increase in both exhibitors and visitors. In Western Europe, production has risen continuously since the early 1970s to reach 1.2mt in 2002. Half this amount was from drylaid nonwoven technologies, 41% polymer technologies and 9% wet laid nonwovens. From 1999-2002, nonwoven production increased from 0.9mt to 1.2mt, with production of spunlace nonwovens increasing by 40% and wipes by 80%. The share of hygiene products during this period fell from 36% to 33%. Processing of viscose staple fibres increased by 44% and of pulp by 23%, while processing of polypropylene (PP) staple fibres only increased 3% and polyester staple fibres increased by 20%. There has also been a marked change in fibre processing to nonwovens using the dry method and elastic nonwovens have become of increasing interest globally. In Western Europe in 2001 was in excess of 2.1mt of which 93% was chemical fibre. 512,000t of this was used in nonwovens, 242,000t for needlefelt and 284,000t for fibrefill and cotton wool. 468,000t was polyester fibres, 420,000t PP fibres and 215,000 cellulose fibre. In 2002, spunbonded production in China expanded by 24% to 171,000t and capacity is predicted to reach 300,000t in 2004.

*Author: Koslowski H-J*

*Source: Tech. Text.*

*Issue: vol. 46, no. 4, Oct. 2003, pp E138, 242d*

### **Thermo-resistant lyocell fibres**

Recycled cellulose fibres such as Lyocell are useful alternatives to glass, aramid and carbon fibres in composite materials. Their low thermal stability restricts the choice of polymer matrix to those of low melting point. Numerous well-investigated substances were used in an attempt to increase the thermal stability of Lyocell fibres without affecting the textile physical properties when added to the dope. Preliminary studies

revealed that cellulose-2,5-acetate, cellulose-triacetate, melamine cyanurate, aluminium hydroxide, magnesium hydroxide, docosanoic acid amide, low-molecular polyamide and silicic acid hydrate were able to meet the process requirements. Commercial flame retardants based on halogen compounds containing antimony trioxide, as well as organophosphoric compounds, were unsuitable. Further experiments were conducted in which additives were added in different concentrations during the dissolution step. It was found that a thermal stabilisation of a blend fibre could be achieved through the application of 2.5-5wt/% docosanoic acid amide as an additive in the dope preparation step, with an acceptable loss of strength. Modified Lyocell fibres with only a slightly decreased initial strength could also be obtained through the addition of silicic acid hydrate in a concentration range between 2.5-10wt/%. Modified fibres with docosanoic acid amide and silicic acid hydrate were embedded into a polypropylene matrix as reinforcement fibres. It was found that a fibre-reinforced specimen could be produced by the established hybrid fleece technology, as well as by injection moulding of long fibre reinforced granulates. (2 fig)

*Author: Berghof K*

*Source: Tech. Text.*

*Issue: vol. 46, no. 4, Oct. 2003, pp E145-E146, 254-255d*

### **Vapor phase filtration by active charcoal incorporated in lyocell fibers**

An activated charcoal modified fibre has been produced using the lyocell technique. Charcoal particles were suspended in the lyocell spinning solution and fibres produced from the solution by passing it through a nozzle into a water bath. The activated charcoal was ground to obtain particle sizes of less than 25 micron in diameter. It is possible to produce fibres with different contents of adsorber and different finenesses. Nonwovens were produced from fibres containing 50% cellulose and 50% char-

coal and the adsorption and desorption behaviour tested for carbon tetrachloride (tetrachloromethane) and toluene, revealing that 20% of carbon tetrachloride remained even after 120h, while toluene was completely desorbed after approximately 50h. The fibres were found to have adsorption efficiencies for carbon tetrachloride of up to 60% and for toluene up to 55%. (3 tab)

*Author: Kolbe A; Buttner R*

*Source: Tech. Text.*

*Issue: vol. 46, no. 4, Oct. 2003, pp E158-E159; 270-271d*

### **Cotton nonwoven Oikos, a safe and reliable product from Nisshinbo KK**

Oikos is a 100% cotton spunlace binder free nonwoven developed by Nisshinbo KK, Japan. Nisshinbo's strict quality control system achieves excellent safety and reliability, which are often problems for products made from natural materials. Oikos is soft and skin friendly, and retains its mechanical strength when wet. It is lint free, air permeable and electrically neutral, and has superb moisture/water absorption. It is also biodegradable by composting and can be disposed of by incineration without generating harmful gases. Oikos is suitable for domestic products, such as anti pollen masks and antibacterial and antiodour products. Iki-Iki-Hospital, developed with Kango Towel Kenkyu Kai, is an award winning new product designed for the care industry. This specially treated Oikos based towel shows excellent wiping and deodorant effects, and is suitable for the care of the elderly and hospital patients. (4 fig, 1 tab)

*Author: Minamoto T*

*Source: Jpn Nonwovens Rep.*

*Issue: no. 9, Sept. 2003, pp 11-14 (In Japanese)*

### **Domestic materials in China, increasing popularity of spunlace wiping cloth**

The nonwoven wipes market in China is growing in parallel with improvements in living standards. Five categories of wiping cloth products are seen on sale

in Shanghai: four brands of spunlace baby products, five brands of spunlace adult products, two brands of airlaid nonwoven wipes for cleansing, three brands of spunlace products for beauty treatment and four brands of household wiping cloths. The majority of the last named are spunlace nonwovens. Although China is one of the biggest producers of cotton in the global market, the quality of cotton is not satisfactory for spunlace applications. The establishment of technology is required for further development in the spunlace industry and market in China. Creating popular brand name products, which will penetrate into the average Chinese households, will help the expansion of the market. (1 tab, 1 ref)

*Author: Takagi T*

*Source: Jpn Nonwovens Rep.*

*Issue: no. 9, Sept. 2003, pp 17-19 (In Japanese)*

### **Creation of new nonwoven products based on the elastic nonwoven technology**

Kimberly-Clark Worldwide (KCWW) has donated intellectual property for the Demique elastic nonwoven technology to the University of Tennessee Research Centre, TS, USA, in December 2000. Demique is a melt-blown nonwoven with random fibre directions, that possesses 600% expansibility and 90% elasticity in any direction. Although Demique did not fit into the KCWW's business strategy due to its cost performance, the Demique technology is worth pursuing to create new nonwoven products. Demique technology has been studied from the academic point of view, and the effects of varying parameters in meltblowing on the characteristics of the resulting nonwovens are becoming clear. (1 ref)

*Author: Anon*

*Source: Jpn Nonwovens Rep.*

*Issue: no. 9, Sept. 2003, pp 33-35 (In Japanese)*

— INJ

# RESEARCHER'S TOOLBOX

### SILVER TREATMENT OF FIBERS

Scientists have known for years that silver can kill germs. Even the ancients had an appreciation for this power. More than 2,500 years ago, Cyrus The Great, King of ancient Persia, directed all his troops to carry water in silver jugs, as this practice kept the drinking supply cleaner than any other container. A pharmacopeia published in Rome in the year 69 B.C. lists silver nitrate as a salve ingredient. Further, wealthy Roman citizens used silver goblets and silver eating utensils to tout their social position, but also to assist in their sanitation efforts.

More recently, silver nitrate solution has been routinely used in hospitals to prevent eye infections in newborns. Treat burns and sanitize rinse water for vegetables and other types of produce. Several years ago, silver-coated nonwoven bandages were introduced into European medical use as specialty wound dressings for burn victims; this product almost completely replaced the petrolatum-saturated nonwoven dressings. The recent world-wide outbreak of SARS (Severe Acute Respiratory Syndrome) focused further interest in this treatment, along with other antibacterials.

More recently several large chemical companies have been making sizable investments into the manipulation of silver and other agents for use in antibacterial textiles. A small company in the woods of Pennsylvania, however, seems to have a substantial head start in the current interest. The company, Noble Fiber Technologies of Clarks Summit, PA, has been licensing its silver-coated fibers and process under the X-Static brand. Several U.S. companies are introducing a variety of textile products into the marketplace under these licenses. Reportedly, some medical products companies have developed a strong interest

in this concept as a basis for a new line of bandages.

In addition to its bactericidal qualities, the X-Static brand treatment conveys antistatic properties along with good heat conduction. The silver ion, especially in the presence of warmth and moisture, kills bacteria by binding with proteins both inside and outside the bacterial cell membranes. This inhibits cell respiration and reproduction. Silver ions do not easily penetrate mammalian cell membranes, however, so the treatment is completely safe for the intended use. Pure, metallic silver apparently releases sufficient silver ions under normal conditions so that a sufficient but extremely low level of silver ions are generated for effectiveness.

The silver treatment is surprising permanent; Noble Fiber representatives indicate that the treatment lasts through at least 250 washes. The silver metal in the treatment can be made visible, if desired, but it normally is invisible to the naked eye.

Socks, sportswear and workwear gear have been the foremost targets of this treatment. The use in socks has been particularly effective, likely due to the moist, warm environment. Also, the silver treatment is especially effective against the fungus that causes athlete's foot. The U.S. Army has apparently adopted the treatment in socks. Other applications in a wide variety of products are being investigated by a variety of companies.

Today, the most widely used antibacterial substance is probably Triclosan<sup>7</sup>, an organic agent used particularly in soaps and deodorants. A substantial concern has been expressed about the ever broadening use of this and similar materials, however, the concern arising in part due to the growing presence in such a wide variety of products; also, the concern is about the tendency for many bacterial

species to develop tolerance to such agents. The silver treatment apparently does not evoke this evolutionary resistance by bacteria.

### SILVER-TREATED ANTIMICROBIAL POLYESTER FIBER WITH MOISTURE MANAGEMENT

As further evidence of the growing textile interest in silver, DAK Americas announced the release of their latest staple fiber innovation, Delcron7 HydroPur Fiber within the past few weeks. The new fiber product combines the technology of DAK Americas SteriPur7AM antimicrobial product with its moisture management product, Delcron7 Hydrotec Fiber. This combined technology creates the new Delcron7 HydroPur, a dual function fiber possessing both antimicrobial and moisture management characteristics.

The new product features Antimicrobial AlphaSan7 from the Milliken company. AlphaSan7 is a zirconium phosphate-based ceramic ion exchange resin that contains the silver active ingredient, again at a very low, but effective level. Laboratory tests have shown that these fibers exhibit significant efficacy against odor causing and unsightly microorganisms, with high reductions having been achieved under normal test conditions.

Moisture management properties keep moisture on the move and provide increased comfort through faster drying. The developers claim that utilizing this new fiber will allow for the development and production of products that:

- Resist deterioration from microbes.
- Provide mildew and odor resistant functionality.
- Prevent discoloration and odors caused by fungal growth.
- Inhibit the growth of bacterial odors.
- Faster drying which provides added comfort.

Both antimicrobial and moisture management technologies are incorporated during the polymer stage of fiber manufacturing, providing durable and safe performance throughout the life of the

# RESEARCHER'S TOOLBOX

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garment or product. In addition, Delcron7 HydroPur Fiber is stated by the developers to be performance engineered to retain the desired aesthetics of existing products while adding increased functionality in the apparel, home furnishings and industrial segments.

DAK Fibers is an affiliate of DAK Americas, LLC. DAK Americas, headquartered in Charlotte, N.C., is a wholly owned subsidiary of Alpek, the petrochemicals and synthetic fibers business group of Alfa S.A. de C.V., one of Mexico's largest private corporations. (<http://www.dakamericas.com>)

## SLEEP AND CREATIVITY

Common sense would suggest that there is a relationship between a person getting enough sleep at night and being able to do well whatever that person takes on. However, it is comforting to learn that common sense is correct in this situation, and to have solid, scientific evidence for this relationship.

A German study on this relationship has provided what experts consider to be the first hard evidence supporting this commonsense notion – that creativity and problem-solving appear to be directly linked to adequate sleep. This study would seem to provide a valuable lesson to overtired workers and students that sleep is often the best medicine. That must especially include individuals engaged in research and development activities.

The results of this study were recently reported in the well-known science journal *Nature*. The methodology involved giving volunteers a simple math test with instructions to figure out a hidden rule for converting the numbers into the right answer. For those who had adequate sleep (approximately eight hours) prior to the testing were three times more likely to ascertain the hidden rule compared to those without adequate sleep.

The researchers who directed the study stated that these and numerous other results support biochemical studies of the brain that indicate memories are restructured before they are stored.

Creativity also appears to be enhanced in the process. This restructuring might be occurring in such a way that the problem is easier to solve. Dr. Jan Born, one of the researchers, said the exact process in the sleeping brain for sharpening these abilities remains unclear. But it appears that memories start deep in an area of the brain called the hippocampus, and are eventually pushed outward to the neocortex to be consolidated.

The changes leading to creativity or problem-solving insight occur during “slow wave” or deep sleep, which typically occurs in the first four hours of the sleep cycle, he said. The findings also may explain the memory problems associated with aging, because older people typically have trouble getting enough sleep, especially the kind of deep sleep needed to process memories, Dr. Born said.

This may fly in the face of what older people often cite, namely the important developments that have come from people who were in the late part of their life. However, there are many and important examples of artists and scientists and others who have awakened to make their most notable contributions. Think what could have resulted if such creativity were unleashed at an earlier age.

Other researchers have long suspected that sleep helps to consolidate memories and sharpen thoughts. Until now, it had been difficult to design an experiment to demonstrate this principle. As stated by Dr. Carl E. Hunt, director of the National Center on Sleep Disorders Research at the National Institutes of Health, “A single study never settles an issue once and for all, but I would say this study does advance the field significantly. It’s going to have potentially important results for school performance and for adults for work performance.”

The Center which Dr. Hunt directs is a very interesting part of the National Institutes of Health, and some exciting and pertinent research work is being conducted there.

A National Sleep Disorders Research Plan was initiated within the Center in 1996. This was a broad and multidisciplinary

effort with a goal to “improve the health, safety, and productivity of Americans by promoting basic, clinical, and applied research on sleep and sleep disorders.”

Stimulated in part by the 1996 Plan and the results that it yielded, sleep research funding by NIH has doubled. Scientists at the Center indicate that new research and new knowledge have vastly expanded the array of technologies, tools and mechanisms for more detailed sleep research, with the result that a 2003 Revision has been inaugurated. It is believed that this expanded plan “will contribute in substantial ways to advancing the frontiers of biomedical knowledge related to sleep, enabling timely diagnosis and effective treatment, and improving the health of the nation through community-based public health education and intervention programs.”

For a very interesting tour of what is being done in the area of sleep disorders, visit the Center at [www.nih.gov](http://www.nih.gov).

For scientists, technicians, administrators and others engaged in nonwovens R&D, the message is clear and the counsel is apparent: In order to be innovative, get enough sleep!

– INJ

# DIRECTOR'S CORNER

## HELP WITH OSHA INSPECTIONS

Nothing can upset the plans and timetable of the typical plant manager or research laboratory administrator like the news that an OSHA inspection has been scheduled.

There is help available, however. One useful approach, especially for installations involving large employers, employers with multiple worksites and locations, as well as others who really don't know exactly what to expect.

An Internet tool offered by OSHA (<http://www.osha.gov/oshstats>) can be used to see data on which companies have been inspected previously; also, when and whether citations were written, whether fines were issued and other related information can be most helpful in considering what to expect. This database can also be searched by SIC code, state and dates to further refine and assist in the preparation.

Inspection data dating from the mid 1970s have been programmed into this site by both federal and state compliance programs. Both state and federal OSHA offices have access in greater detail than the public to this database, and those same compliance offices may use these data to make OSHA citations "repeat" violations. Thus, if a company or a location has been cited for the same offense, or if the offense has been noted at another company location, whether you knew about it or not, such information can be use to substantiate the "repeat" nature of the violation.

Consequently, a study of this database can be very helpful in preparing for such a visit, or even for a quick review of those items that should be on the

mind of the administrator, plant manager or team leader.

## POISON CONTROL CENTERS

Although it is to be hoped that it is never used, it is wise to keep a reference to a Poison Control Center handy in the laboratory, the plant, or any other workplace.

The American Association of Poison Control Centers provides a variety of helps that are really meaningful in almost any environment, including both work, home and elsewhere. U.S. poison centers managed more than 52,000 occupational poison exposure cases in 2002.

The AAPCC urges safety managers and all personnel to keep the poison emergency hotline number – (800) 222-1222 – posted near phones, workplace phones and others. .

Calls to the hotline are automatically connected to nurses, pharmacists and doctors at the closest poison center for free, confidential, round-the-clock treatment advice. In most cases, poison center experts manage the case over the phone, and a trip to the hospital is not required.

Free stickers/magnets with the hotline number are available by calling (800) 222-1222 and speaking with the education coordinator. Very likely there are other aids and features that can be provided to help the busy manager, researcher and administrator.

## KEEPING VALUED EMPLOYEES

A variety of methods designed to help retain valuable employees have been

discussed several times in these columns in the past. Justification for such repetition and emphasis, of course, is the expense, trouble, and at times, the real loss with the resignation of an employee that cannot be replaced.

One potential approach, and one that has been rather widely used within the nonwovens industry, is the employee Noncompete Agreement (NCA). Many old-timers within the industry can cite instances when the NCA worked to protect an employer, instances when it did not provide any protection, and many instances when it was not used but should have been.

Basically, a NCA specifies that an employee will not work for a competing firm with a specified geographical area for a specified period of time. Typically within this industry, an employee may agree to not work for a company within the U.S. industry (specified narrowly or broadly) for a period of two years upon leaving company employment.

State law normally governs such agreements, and as a consequence, there is considerable disparity in the ways that the law may be written and may be interpreted. For that reason, generalities and exceptions abound. Thus, such a discussion is not intended as a legal opinion, but rather as guidelines and a basis for further investigation.

In most instances, the NCA is enforceable only if certain conditions are met:

- It is a part of an employment relationship.
- The employee is compensated for signing the NCA.
- The duration and geographical boundaries that pertain are "reasonable."

The first requirement is very simple; signing an NCA is a part of employment, and only an employee would be asked to sign.

The second requirement must be reflected in the compensation that the employee receives. Under the law of most states, an employer's agreement to hire an employee is considered adequate consideration to support a NCA. If the employee was not required to sign

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the NCA at the time of employment, but thereafter was required to sign, then such a step is an extension of the original employment and there must be some consideration for this additional factor.

The third requirement is generally the most troublesome for an employers. The question is the definition of "reasonable," both as to duration and geographic limitation. If a court holds that either one of these is unreasonable, then an additional consideration must be provided by the employer. Within the nonwoven industry, this has meant at times that a person going to work for a nonwoven producer in a foreign country is not restrained from such employment. Also, within the industry an employee has had to be compensated for an employment restriction, resulting in the employee not being able to take a job, but the former employer being required to continue the normal salary.

In other instances within the industry, an employee has been limited in the assignments given by the new employer. A guiding principle is that an employee cannot be denied the right to earn a gainful living.

Other factors that must be considered include:

- The position that the employee held and is taking in the new assignment.
- The amount of training that the employer provided the employee.
- The degree of access to customers that the employee has.
- Access the employee has to confidential business information.
- Length of time that the employee worked for the employer.
- Geographic area in which the employer does business.
- Geographic area in which the employee works.

By way of guidelines, courts have generally held that NCAs over five years are excessive and unreasonable. A requirement for employment restriction worldwide is generally held to be invalid, because of the geographic scope; a nationwide restriction is enforceable, but may be further limited.

A confidentiality agreement between a company and its employees can also be used to protect proprietary commercial information. In reality, however, such agreements are often of limited value in preventing harm. At the most, a court may issue an order requiring the employee to return to the original employer any confidential materials, and agree to not use them in the future. Such an order may do little to prevent and to limit the harm that can be done.

Some of the most valuable protection in a confidentiality agreement situation is that it may effectively dissuade the second employer from pursuing an employment offer that may result in costly litigation and liability. This may also be the prime value of a NCA. After all, it does not cost the original employer anything, and it may forestall loss of valuable technical and business information.

In some instances, the amount of time considered reasonable may depend upon the nature of the businesses involved.

## THE POWER OF THE PEN

Speaking of keeping valued employees, the R&D administrator shouldn't forget the power of the pen, the pen that writes a letter to that employee who needs a lift.

One of the strongest motivators to those who give full effort, those who try again in the face of failure, those who reconsider and discover as a result, to those really innovate – a letter from the boss! The letter can be an encouragement, it can be a thanks or a congratulation, it can simply be a "well-done," even for a small contribution.

The wise manager knows the power of up-strokes. And that same wise manager no doubt has his/her own file of special letters that provided the right word at the right time, and hence was worth saving.

It is a wise manager indeed who uses the power of the pen to get maximum performance from the "team," who also uses the same power to give credit and a

word of encouragement.

In this day of instant communication, the succinct E-mail (even terse and sloppy), short voice-mail and a disdain for "snail mail," wise managers still know that a letter to the people doing the work can indeed work wonders.

While it is true that many business letters are a chore, the wise manager also knows the value of incentives and awards, and recognizes that a thoughtful letter can be the most valued form of such perks. Hence, wise managers use and carefully hone this skill.

The following tips on better letter writing likely cover all types of business letters; they come from those who have made of career of studying this skill. They still can be pertinent in writing that personal letter that can work miracles. Here they are;

**1. Know Your Purpose** - Those who teach this skill generally put this item first. Keeping in mind the reason you are writing helps keep you focused and concise, while avoiding the ever present temptation to wonder off and get lost. This factor can often be pursued by writing a one-line synopsis of the mail point to be conveyed. This step can provide needed focus.

**2. Know Your Audience** - Understand the readers' needs and expectations. Visualizing the reader sometimes helps in this regard. This step can often lead to a flowing of the words.

**3. Be A Reporter** - Use the old technique taught to reporters: who, what, where and why. Although somewhat trite, this can make good sense for business writing.

**4. Keep It Concise** - Writing more does not necessarily equate to better writing. Remember that Lincoln's Gettysburg Address consisted of only 267 words. The power is in the message.

**5. Keep It Simple** - In some quarters, writing sounds sophisticated by using complex sentence structure and big, fancy words. For best results, however, simple, direct sentences and plain, unambiguous words are most successful.

**6. Use Active Voice** - By using the

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active voice instead of the passive, a more direct message is possible. It can eliminate the need for complex sentence constructions and can help to deliver the message.

**7. *Don't Offend*** - There is almost never a need to offend in letter writing. Even if a reprimand is appropriate, do it in a way where the reader can recover and still go on.

**8. *Be Consistent*** - A style manual may not exist within your company, but consistency in writing is an aid to communication and simplifies matters for both the reader and the writer.

**9. *Don't Depend on Spellcheck alone*** - Nothing can replace a careful re-reading of a letter or a document. Our profession and industry is loaded with abbreviations and acronyms, so even your personalized spellchecker may give rise to confusion.

**10. *Don't Just Write, Rewrite*** - Revision is a necessity in good writing. If the document is especially important, the standard of 3 drafts is appropriate. For a personal letter, this is not as important, but even here a rewrite may ensure getting it right!

Remember, nothing can motivate like a pat on the back, especially if it can be appreciated another time. Remember, the smallest deed is greater than the grandest intention! — INJ

# PATENT REVIEW

## ANNUAL LIST OF TOP 10 ORGANIZATIONS RECEIVING U.S. PATENTS

Each year the United States Patent and Trademark Office (USPTO) prepares a listing of those private organizations that receive the most U.S. Patents during the course of the year. The listing is viewed as a definitive measure of the technical prowess of the world's corpo-

rations, as the list is always dominated by world-wide industrial firms.

Although the quality of the patents granted is not considered, the sheer number of patents awarded certainly does testify of the technological power and commitment of these organizations. Receiving a single U.S patent can denote a rather considerable accomplishment. When the number of patents is in the

hundreds, such an organization is truly a technical giant.

For the eleventh straight year, the list is headed by International Business Machines (IBM), with 3,415 patents received. This strong showing is augmented by the fact that IBM had 76% more patents received than the next highest patent holder, Canon KK of Japan did.

Review of the results shows that Japanese companies (all of them electronics and computer related) dominate the list. However, the showing of U.S. companies is improving. This year marks the first year that Intel Corporation appears on the Top Ten list. Intel Corporation increased its number of patents 48% over the 2002 result, and Hewlett-Packard Company increased its patent grants 27% over its 2002 count.

Every company in the Top Ten list, except one, had more patents granted in 2003 than in 2002. The U.S. Government received 879 utility patents for the year, which would rank it as No. 17 among the top patenting organizations for 2003.

As stated by Jon Dudas, Acting Under-Secretary of Commerce for Intellectual Property, "Patents protect intellectual endeavors and encourage technological progress, helping to nurture industries that create jobs for Americans."

The results for the year 2003 are as follows show in the top chart at left.

TOP TEN PATENTING ORGANIZATIONS FOR 2003			
2003 Rank	Private Organization	No. Of Patents Granted	2002 Rank
1	IBM	3,415	1
2	Canon Kabushiki Kaisha	1,992	2
3	Hitachi, Ltd.	1,893	5
4	Matsushita Electric Industrial Co.	1,786	6
5	Hewlett-Packard Development	1,759	9
6	Micron Technology, Inc.	1,707	3
7	Intel Corporation	1,592	15
8	Koninklijke Philips Electronics	1,353	16
9	Samsung Electronics Co., Ltd.	1,313	11
10	Sony Corporation	1,311	7

TOP TEN PATENTING UNIVERSITIES FOR 2003			
2003 Rank	Institution	No. Of U.S. Patents	2002 Rank
1	University of California	439	1
2	California Institute of Technology	139	3
3	Massachusetts Institute of Technology	127	2
4	University of Texas	96	5
5	Stanford University	85	4
6	University of Wisconsin	84	6-7
7	Johns Hopkins University	70	6-7
8	University of Michigan	63	12
9	Columbia University	61	13
10	Cornell University/University of Fla.	59	--

## TOP 10 UNIVERSITIES RECEIVING MOST PATENTS IN 2003

In addition to identifying the Top Ten private organizations receiving U.S. patents, the USPTO has assembled a listing of the Top Ten Universities receiving the most U.S. patents in 2003 (actually 11, because of a tie). Again, the level of patent activity amongst academic institutions is viewed as an important measure of the technical competence of a research university.

While this position may not be universally accepted, the amount of patent-

ing activity certainly relates to the ability of an institution to participate in technology licensing, birthing of new high-tech companies, and similar activities. Other factors, such as the historical tradition of seeking patents and licensing patents, the fields of expertise, the role and use of government and other research grants, as well as additional elements undoubtedly relate to the extent of this activity.

Also, in today's climate, the question of whether a university emphasizes teaching or research certainly has an important influence on an institution's interest in obtaining patents.

All of the campuses of a particular university are included in the count. The results for the year 2003 are shown in the chart on the previous page.

When individual patents granted to universities are examined, some people may question the value of public funds supporting most such institutions. That notion may seem a little narrow, but there are some strange items apparently receiving sufficient academic attention to receive a patent. Consider the following examples:

- University of California - Liposuction apparatus and method.
- California Institute of Technology - Tracking handwriting with a camera.
- Massachusetts Institute of Technology - Treatment of personal stress.
- University of Texas - Method of treating hair loss.
- Stanford - Mouse with humanlike liver.
- University of Wisconsin - Cranberry variety named "HyRed."
- Johns Hopkins University - Way to monitor person's alertness.
- University of Michigan - Treatment of aging skin.

There is probably a good reason and full justification for each one of these patents. After all, the "outside world" might consider a patent for "Disposable diaper with reduced sideways leakage" to be a little frivolous for scientists, engineers, product development specialists

and technicians to get truly excited about.

## QUARTERLY PATENT REVIEW

*Aliphatic polyester microfibers, microfibrillated articles and use thereof; US 6,645,618 (November 11, 2003); Filed: April 26, 2002. Assignee: 3M Innovative Properties Company (St. Paul, MN). Inventors: Terry R. Hobbs, Phillip P. Soo, Mario A. Perez, Christopher K. Haas, Robert S. Kody.*

This invention relates to aliphatic polyester microfibers and films having a microfibrillated surface, and methods of making the same.

The microfibers of the invention can be prepared by imparting fluid energy, typically in the form of high-pressure water jets such as used for hydroentanglement of spunlace nonwovens, to a highly oriented, highly crystalline, aliphatic polyester film, which has been processed to have a microfibrillated surface.

The substantial hydraulic action of the water jets act to liberate microfibers from the film. The microfibril-surfaced films of the invention can find use as tape backings, filters for particulate contaminants, such as face masks and water or air filters.

Other applications include fibrous mats, such as those used for removal of oil from water and those used as wipes, and thermal and acoustical insulation.

Microfibers of the invention, when removed from the film matrix may be used in the preparation of nonwoven articles and used as wipes for the removal of debris or dust from a surface. The microfibers and microfibrillated articles of the invention may be produced from aliphatic hydroxy acids, making them biodegradable and useful for geotextiles.

*Substrates comprising flocked fibers of superabsorbent polymer; US 6,692,811 (February 17, 2004); filed: July 19, 1999. Assignee: McNeil-PPC, Inc. (Skillman, NJ). Inventor: Vincent P. Lasko.*

The invention discloses a substrate material having flocked fibers of superabsorbent polymer (SAP) placed thereon.

Preferably, the substrate is selected from the group consisting of nonwoven materials, polymer films, breathable materials, apertured films, and absorbent layers. Fibers of SAP material are applied to one or more surfaces of the substrate by the process of flocking.

Typically, a substrate such as a nonwoven napkin cover, is coated with adhesive on all or a portion of its surface. The coated substrate is then passed through a fiber metering station in which an electrostatic field is maintained around the substrate, using electrodes situated above and below the substrate. The fibers are applied to the adhesive on the substrate in the presence of the electrostatic field, which orients the fibers perpendicular to the substrate as they contact the adhesive. The substrate is then heated, polymerizing the adhesive and anchoring the fibers. Unattached fibers may be vacuumed away.

Flocked fibers of a second hydrophilic material, a hydrophobic material, or combinations thereof may also be adhered to the substrate with fibers of the SAP.

The substrate is preferably used as part of an absorbent article, for example a sanitary napkin, pantiliner, diaper, incontinence pad, interlabial article, wound dressing, baby wipe, feminine hygiene wipe, nursing pad, or other similar product for absorbing bodily fluids. Preferably, the absorbent article is a sanitary napkin or a pantiliner

*Bicomponent nonwoven webs containing splittable thermoplastic filaments and a third component; US 6,686,303 (February 3, 2004); filed: November 13 1998. Assignee: Kimberly-Clark Worldwide, Inc. (Neenah, WI). Inventors: Bryan David Haynes, Billy Dean Arnold, Justin Max Duellman, Ryan Clinton Frank, Jeffrey Lawrence McManus, Charles Allen Smith, Ty Jackson Stokes; Kevin Edward Smith,*

# PATENT REVIEW

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*Darryl Franklin Clark, Debra Jean McDowall, Samuel Edward Marmon, Christopher Cosgrove Creagan, Xin Ning, David Lewis Myers.*

This invention describes an improved nonwoven composite produced from spunbond or meltblown splittable filaments. The split filaments utilized as a matrix for ensnaring, containing and restraining another component of other fibers and/or particles, which are incorporated in the composite to provide greatly increased absorbency.

The two polymers employed in the bicomponent fibers of this invention are "incompatible polymers", which indicates the polymers do not form a miscible blend when melted together. Such polymers are characterized by having a substantial differences in their polymer solubility parameter (D). Desirably, the adjacently disposed polymer components of the present conjugate fiber have a difference in D of at least about 0.5 (cal/cc)<sup>1/2</sup>, most desirably at least about 2 (cal/cc)<sup>1/2</sup>. The upper limit of the D difference is not critical for the present invention as long as:

(1) the filaments do not split prematurely so as to interfere with spinning, and

(2) there is adequate control over the splitting.

Particularly desirable pairs of incompatible polymers include polyolefin with polyamide, polyolefin with polyester and polyamide with polyester combinations, including copolymers and polymer blends of each chemical type, so long as the two polymers are incompatible with each other.

Generally, the splittable bicomponent thermoplastic filaments preferably contain about 40-60% by weight of each incompatible polymer.

Other fibers which can be employed as a third component include absorbent fibers, such as rayon staple fibers, cotton fibers, natural cellulose fibers such as wood pulp fibers and cotton linters, superabsorbent fibers and similar materials. In one highly advantageous embodiment, the third component includes a combination of pulp fibers

and superabsorbent particles and/or fibers, to form a highly absorbent nonwoven web composite.

The splitting of the bicomponent filaments may then be effected using a variety of known techniques. When a hydrophilic material is used as one of the incompatible polymers, splitting may be accomplished without mechanical agitation using an aqueous split-inducing medium. Aqueous split-inducing media suitable for the invention include unheated as well as hot water. A desirable split-inducing media is hot water having a temperature between about 65 and 100 degrees. C. With appropriate polymer incompatibility, splitting by a complex process such as high pressure water jets is not required. Consequently, a much simpler, more economic process can be used.

*Method and apparatus for production of sub-denier spunbond nonwovens; US 6,692,601 (February 17, 2004); filed: May 21, 2002. Assignee: None. Inventors: Gerald C. Najour (Norcross, GA), Gregory F. Ward; (Alpharetta, GA).*

A sub-denier spunbond nonwoven product is formed by use of the disclosed apparatus and method. The apparatus comprises a unique multi-head resin metering system, a spinnerette head with spinning sections, separated by a quench fluid extraction zone, a two-sided, multilevel quench system, a fluid volume control infuser system which automatically guides the filaments into the filament drawing system. This arrangement conserves energy by using a portion of the quench fluid as part of the drawing fluid and also by minimizing turbulence at the entrance to the draw slot.

The filament drawing system comprises a draw jet assembly with adjustable primary and secondary jet-nozzles and a variable width draw jet-slot.

The entire draw jet assembly is moveable vertically for filament optimization by providing a variable distance from the spinnerette head. The offset, con-

stant flow secondary jet-nozzle system provides an unexpectedly high velocity increment to the filaments by oscillating the filaments and increasing their drag, resulting in remarkably low fiber denier on the order of 0.5 to 1.2 dpf.

*Durable hydrophilic nonwoven webs and articles formed therefrom; US 6,696,373 (February 24, 2004); filed: November 29, 2000. Assignee: BBA Nonwovens Simpsonville, Inc. (Simpsonville, SC). Inventors: Larry L. Kinn, Gregory Neil Henning; Clement J. Haley.*

A nonwoven fabric produced from a web comprising multicomponent fibers (MCF) bonded by a multiplicity of bond sites is claimed.

The MCF web may be formed from air-laid staple fibers, carded staple fibers, a wet-laid web of staple fibers, a web of meltblown fibers or a spunbond web of substantially continuous filaments.

The MCF are produced from a hydrophobic polyolefin first component and a second component formed of a blend of a hydrophobic polyolefin and a hydrophilic melt additive. The hydrophilic melt additive is a mixture of hydroxy phenols and polyethylene glycols.

The preferred configuration is a sheath-core bicomponent fiber where the hydrophobic polypropylene forms the fiber core and a modified hydrophilic polyolefin (PP or PE) forms the sheath.

This invention is claimed to provide advantages over prior practice by producing a nonwoven having both hydrophilic and hydrophobic regions as opposed to normal hydrophilic topical treatments. Additional wettability is achieved with incorporation of the surfactant and the increased wettability is achieved simultaneously with an increase in fabric strength.

*Chemically modified nonwoven articles and method for producing the same; US 6,673,125 (January 6, 2004); filed: February*

# PATENT REVIEW

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8, 2002. Assignee: Milliken & Company (Spartanburg, SC). Inventors: Brian C. Miller, Raymond C. Sturm.

A chemically modified nonwoven fabric that exhibits pilling resistance, soil release, improved strength, and abrasion resistance properties is claimed. The treatment renders the fabric less prone to formation of objectionable pill balls, staining, or loss of strength, thereby retaining the desired appearance of the fabric and extending the useful life of an article made from it.

The chemical treatment, which is particularly applicable to the split filament spunbond product EVOLON 7 by Freudenberg, comprises a hydrophilic silicone; a soil release agent selected from the group consisting of acrylics, fluorocarbons, liquid polyesters; an abrasion resistance agent comprising a polyethylene or poly-urethane agent; an ethoxylated long chain alcohol wetting agent. This treatment allows the use of this nonwoven fabric in apparel, household and related applications with improved performance characteristics.

5, 2001. Assignee: Polymer Group, Inc. (North Charleston, SC). Inventors: Nick Mark Carter, Cheryl Lynn Carlson, Shane James Moran.

The present invention is directed to a spunlace nonwoven fabric used on a paint roller for enhancing the aesthetic appearance of a painted surface.

The spunlace fabric has a 3-D image imparted therein, which induces a topical modification in the painted surface when the paint is applied by means of the roller covered with the spunlace nonwoven fabric; the topical texture is either the actual or perceived texture of a surface when the imaged nonwoven fabric is applied to and then removed from the surface.

The imaged nonwoven fabric exhibits low linting qualities, thereby reducing the potential of fiber contamination of the painted surface and has good durability over multiple uses, including good washability. A variety of patterning effects are possible. — INJ

*Meltblowing method and system; US 6,680,021 (January 20, 2004); filed: October 20, 2000. Assignee: Illinois Toolworks Inc. (Glenview, IL). Assignee: Illinois Toolworks Inc. (Glenview, IL). Inventors: Kui-Chiu Kwok, Edward W. Bolyard, Jr., Leonard E. Riggan, Jr.*

A meltblowing method and system is disclosed. The system is arranged for dispensing two resin fluids from a single orifice of a die assembly to form a meltblown filament.

The die assembly directs the first and second fluid flows at an equal flow rate toward a common orifice of the die assembly. The die assembly is retained under compression between opposing end plates which are coupled to an adapter for further coupling to a main manifold having the fluid metering device.

*Imaged nonwoven fabric for imparting an improved aesthetic texture to surfaces; US 6,675,429 (January 13, 2004); filed: January*

# TECHNOLOGY WATCH

## TOP TEN TECHNOLOGIES TO WATCH FOR IN 2004

Anyone engaged in research and development knows how difficult it is to predict a discovery or a breakthrough. Such occurrences are impossible to schedule.

However, when a project has gone through considerable development effort, when the faulty experiments have been carried out and lessons learned, when the results have become much more predictable, when the sweet smell of success is all around, it is certainly much easier to predict the fruition of all the effort. The timing may still be a little questionable, but the goal is in reach.

Such a condition is apparent with selected technologies that will likely impact the world within the next twelve months, certainly within the next 24 months. One observer of the technology scene (David Pescovitz, CNN.com) has assembled his notion of the top 10 technologies to watch in 2004. Although his picks are heavy in the "computing category," this segment is certain to have an impact on R&D, as well as virtually the entire population.

Although the timing may vary somewhat, these promising innovations could impact your life in the year 2004.

**1. Home Networking** - While Wi-Fi wireless technology has found its way into some homes, the use of Ultra-wide-band will really supercharge the home networking capabilities. With roughly 45 times the data transmission speed of a typical Wi-Fi setup, numerous new and astounding uses can be achieved with this technology. Consider your television set in the living room; with this system, the set can wirelessly send three different TV programs to separate monitors in various locations. Low-cost and low-power will allow numerous

other uses within reasonable transmission ranges.

**2. Supply Chain Radio Frequency ID** - This technology involves miniature identification tags that are so small and flexible that they can be used on individual product items as well as cartons. RFID (radio frequency identification) have yet to appear in a big way in the supply chain, but Wal-Mart is making it happen. All of its suppliers must use the tags for pallets and cases of merchandise by 2005. Also, the Department of Defense has stipulated that its top 100 suppliers must also implement these systems by 2005 as a means for tracking the distribution of supplies. In response to these actions, Oracle Corporation has announced that its next version of Warehouse Management software would support and handle RFID and electronic product (EPC)-based tracking. This will certainly open the doors to greatly expanded usage of RFID, and the potential applications will explode.

**3. Wireless broadband** - WiMax (802.16 frequency) enables wireless networks to extend as far as 30 miles and transfer data, voice, and video at faster speeds than cable or DSL. It will be invaluable for Internet Service Providers (ISPs) to offer their services and resources into sparsely populated areas, where the cost of bringing in DSL or cable wiring is too high. It obviously opens up new opportunities to extend the capabilities of Wi-Fi wireless technology over very considerable distances.

**4. Micro fuel cells** - Miniature fuel cells to provide a source of modest amounts of power for specialty uses. Japan's largest wireless phone carrier, NTT/DoCoMo, plans to introduce cell

phones powered by miniature fuel cells - which will run on hydrogen or methanol - late next year. The cells will convert some of the energy contained in the fuels into useful electrical power. This means that small units can be used as an expensive power source for high-end laptops and similar specialized power applications.

**5. Super Adhesion** - Lizards climb walls using the mechanical adhesive force of millions of tiny hairs on their feet. A synthetic version of those microscopic hairs allows GECKO tape, developed at England's University of Manchester, to stick to almost any surface without glue. Suggested applications include gloves that allow a person to climb a glass wall, the ability to move computer chips in a vacuum, and new types of wound dressing bandages. Also, a household food storage film product already on the market provides excellent adhesion to a smooth surface by means of the film's micro-structure on one side. Further, researchers at Purdue University have studied the binding properties of mussels as a basis for new adhesives. They have found that the glue-like substance secreted by mussels at the end of dozens of tiny filaments - often referred to as its beard - attach the mussel to its home, and with an amazing tenacity.

**6. Software** - Consider anti-spam software that works. If you've tried filters, whitelists, and blacklists, chances are you still receive plenty of junk e-mail. "Challenge/response" technology may be the answer. It requires senders to manually verify their identity before e-mail is passed along to the intended recipient. Other software packages of both a passive and active nature, will offer the computer and internet user greater capabilities and less frustrations from a myriad of situations.

**7. Consumer electronics: OLEDs** - Organic light-emitting diodes (OLEDs) are brighter and use less power than

normal light-emitting diodes. The latter on carbon with nitrogen, oxygen, and hydrogen elements, hence the “organic” tag. The OLEDs will be perfect for screens on cell phones, digital cameras, camcorders. This will even be true for a new crop of affordable flat-panel monitors and other devices that become realistic with this development.

**8. Lighting** - LED light bulbs will out-run obsolescence by moving into the home. Philips is already pushing its Luxeon line of LED light bulbs, which can last 10 to 50 times as long as incandescent bulbs while consuming 80% less energy. This technology will also open up new applications that have not previously been practical.

**9. Computer memory** - Magnetoresistive random access memory (MRAM) is in theory more than 1,000 times faster than the fastest current nonvolatile flash memory and nearly 10 times faster than DRAM. “Nonvolatile” means it retains memory when the power is off. Add in its low power consumption, and it’s perfect for use in an upcoming crop of computers, cell phones and other memory-driven devices. .

**10. Medicine** - Included amongst the truly exciting development in medicine is Bioinformatics. Researchers, such as those at IBM Life Sciences, are finally getting a handle on building complex protein models to aid in drug discovery. The new, computationally accurate models mean that potential drugs can be identified more quickly and stand a better chance of working. Also, targeted drugs, where the dosage and delivery system is personalized for the specific individual, will greatly benefit those needing such assistance.

How can nonwoven products and nonwoven technology augment these new developments? Obviously such new technology will have to be closely examined, with the attitude C Of course there are potential uses; lets find them!

## REVIEWING CORPORATE PATENTS

A few issues of INJ ago, a consulting group that routinely studies the patents issued to a select group of publicly-owned U.S. companies was discussed. The company is CHI Research, located in Haddon Heights, NJ (Haddon Heights, NJ 08035; 10 White Horse Pike, Tel.: 856/546-0600; Fax: 856/546-9633; www.chiresearch.com ).

CHI Research’s review of a company’s patents goes beyond simply counting them. They use a strict quantitative method to assess the strength of the company and its potential for profitability and growth. Their focus is primarily on companies having a strong technical base and are involved in industries where technology is important. Their current target group consists of 477 companies.

CHI Research uses a technique they call “Citation Impact” to measure the importance and utility of a company’s patent grants. This measure is a review of how frequently the company’s patent is cited in later patent applications. They also evaluate how many references a patent makes to academic papers, which they consider to be a good measure of how closely to basic science the company is working – the closer the better.

Their technique also notes how quickly the company exploits scientific advances, by checking the median age of patents cited in their applications, as well as using other criteria for assessing the technical strength of a company. In addition, their assessment also includes some financial measures, such as the company’s stock price-to-book value ratios and other financials.

A recent review of their performance in the top 10 tech-stock companies selected by their data for investment in the year 2002 showed some outstanding results. Their picks returned an average of 59.2% total return for a two-year period, while the NASDAQ 100 and Standard & Poor’s 500 indexes returned 4.2% and 6.3%, respectively. This performance was achieved even with three of

their selections showing a negative return.

In 2003, as the average tech-stock mutual fund returned 55.9%, CHI’s picks returned 162%.

The company originally got involved in this activity by reviewing patents for the National Science Foundation. Their prowess in predicting financial success has given them a lot of publicity, although they still do considerable work of a technical assessment nature as opposed to the financial prognostications. Their evaluation system has allowed them to make some very successful predictions in the area of technology growth and technology evolution as well. As one might expect, they have patented the methodology.

## THE HAZARDS OF CELL PHONE ELECTROMAGNETIC RADIATION

Several years ago, this Department carried some information regarding the concern centered on electromagnetic radiation stemming from proximity to high-voltage power lines, the use of cell phones positioned so close to the brain, and similar circumstances. Do such situations constitute a real hazard?

The somewhat preliminary studies at that time concluded that there was no real problem involved. Go ahead and use that cell phone a lot. Don’t hesitate to live under high tension power lines. However, there was the usual caveat that further research was needed.

Now comes a more recent research study (*American Journal of Epidemiology*, Vol. 159, p 277) involving a much larger population. These results are actually the first in a series of anticipated nationwide studies being carried out in Europe. This Danish study is likely to carry more weight with health authorities and scientists because of its larger sample size and careful design, compared to most earlier studies.

The Danish study has concluded that the use of mobile phones poses no increased risk of brain cancer — however there is a caveat – at least not for the

first 10 years, according to the Danes.

This study is a part of a huge INTERPHONE study, organized by the International Agency for Research on Cancer (IARC). It involves 13 different countries and aims to answer definitively the question of whether mobile phone use is safe.

In the short term, the study indicates there is no danger of developing tumors, says principle investigator Helle Christensen, at the Institute of Cancer Epidemiology in Copenhagen. One key aspect of the new study is that it was "population-based," that is, the researchers attempted to recruit every new case of a rare brain tumor in Denmark's entire population of 5.3 million people over a two year period. In total, 106 people were identified and their phone usage and medical records were then compared with those of 212 randomly chosen controls, matched for age, sex and socio-economic status. The researchers found no difference in mobile phone use between the two groups.

The tumor type studied, called an acoustic neuroma, is a rare benign tumor that forms between the brain and the inner ear. It is located right where the radiation is most intense. According to the researchers, if mobile phones are in some way able to influence tumor tissue, it should be able to influence acoustic neuromas. Further, the researchers found no correlation between the side of the head on which the phone was used and the side on which tumors formed. And no difference was seen between people who started using old analogue phones or the more recent digital phones.

Unfortunately, too few of the subjects had used phones for more than 10 years to tell if there is a long-term risk, according to the researchers. There were not just fewer people using phones back then, but also those that had such phones used them much less frequently than they do today.

When the data from all 14 studies are collected over the next 18 months, the number of long-term users should be

somewhat larger, hopefully large enough to reveal any small increases in risk beyond 10 years of use. The researchers at IARC will be carrying out the final analysis of the total INTERPHONE study.

In the meantime, go ahead and use your cell phone, but – check this space later!

## FASHIONABLE FILTERS FOR BREATHING

One of the noteworthy oddities of the Orient which visitors used to bring back to share with friends and neighbors was the strange sight of people on the streets of Tokyo wearing face masks. This strange behavior resulted from the notion that wearing such masks lowered the risk of acquiring colds, flu and other easily transmitted maladies.

Almost invariably, the masks used in years past were the old style surgical face mask utilizing about 16 layers of woven cotton gauze fabric, a la the masks shown on re-runs of old "M.A.S.H." television shows.

It is now well established that such masks provide little protection, except for the occasional full frontal sneeze giving rise to a lot of air-borne aerosol particulate or droplets. Such comparatively large particles are captured by a gauze mask, but not much else.

Since the SARS (Severe Acute Respiratory Syndrome) problems in Asia and elsewhere in the world, the sight of people wearing face masks during normal activities is not nearly so unusual. However, some people still have considerable concern with crowded environments, especially where ventilation is problematic.

One novel solution that is being promoted for this problem is the use of really effective face masks in public places and suspected environments. One company is promoting their designer face masks for "filtered breathing" under the brand name of "Face-It Fashions."

These masks are made of an antibacterial woven fabric, with a disposable

"medical inner filter" that is replaced as needed. The fashion face masks are marketed in 14 fabrics and colors (Silky Sage, Primary Plaid, etc.), plus a so-called health, safety and recreation line of masks in four basic colors.

The manufacturer (EnviroAir, Salt Lake City, UT; Tel. 801/355-6444) claims its Face-It Fashions masks are good for germs, smog, noxious smells and second-hand smoke. Other irritants may include such items as bacteria, viruses, mold spores, animal dander, smoke, fine dust particulate. Use of the mask by persons with asthma and other afflictions is also indicated.

Keith Radley, the Business Development Director at EnviroAir, states that invariably he uses his mask when traveling on an a commercial airliner, as well as in theaters and on buses and other public transportation. He points out that it is a common practice to give people an award for a perfect attendance record; this practice strongly encourages people to come to work or school, even when they are sick.

These sentiments are echoed by complaints arising from airline flight attendants. Their Association of Flight Attendants last summer submitted a 32-page report to Congress, claiming that "On aircraft, there is no ventilation standard, despite the fact that aircraft are the most densely occupied of any environment." A respiratory problem acquired on an long commercial airplane flight was the impetus for forming the EnviroAir company and developing the product line.

Perhaps the nonwovens industry and the related medical and personal care products industries are missing a good opportunity for a new product category. With the SARS scare and recurring flu seasons, and especially with fashionable and really effective breathing protection products (perhaps equivalent to an N-95 mask or better), a new and an acceptable practice of wearing masks in crowded environments might be possible.

Maybe the Japanese citizens had a good idea after all. — INJ

# NONWOVEN NET

### SEARCHING FOR A SEARCH ENGINE

One of the most magical features of a good computer is the FIND function. Instead of ploughing through innumerable files, sub-files and documents, reminiscent of the old-fashioned practice of leafing through stacks of papers on the desk, the chairs, the window and the floor, a couple of key strokes and, Voila, there it is. How wonderful!

A similar situation exists, although magnified many times, when it comes to searching for that one piece of needed information on the wonderful World Wide Web. However, instead of stacks of paper to wade through, there is literally millions and millions of pages.

Enter the Search Engine.

By means of this critter, it is possible to Seek and Find on the web; at least to "seek;" whether you "find" or not may depend a great deal on your skill and understanding of the ways and means of the search engine; or better yet, of various search engines.

As most web surfers know, the number and variety of public and free search engines is still growing. There is the inevitable jousting for position amongst the various engines, as this business has become a very BIG business.

Search engines generally rely one or both of two principal systems or search schemes:

- Spiders, the so-called webcrawlers that search automatically through pages on the web, performing indexing tasks.

- Human-based editing and arranging directories.

Different algorithms or methods are used for the searching and indexing functions by the different companies managing search engines. Consequently, the same terms entered into a search action may give different results, depending upon the specific search engine.

This means that the searcher should know the capabilities and specialties of a specific search engine, and also, the searcher would be wise to use more than one search engine for a serious search.

Many search engines have their own specialized subject material, and are of very limited use outside that specialty. For example, AllTheWeb ([www.alltheweb.com](http://www.alltheweb.com)) provides specialized audio and video searching capabilities. The search engine Northernlight ([www.northernlight.com](http://www.northernlight.com)) has been a favorite of scientists and technicians, but more recently is being transformed into private specialty markets and uses.

The size of the index being employed for the search has normally been considered a measure of the ability to get the best results. However, bigger may not be better. The time taken to perform a search is generally inconsequential; some searches now include the time taken to provide the results, by way of bragging a little; a typical general search may involve only 0.2 second and yield over 50 pages of citations, so the speed is there!

Generally, a specific search engine will only search through an index that it has created. This index may have resulted from automatic spidering (meta-crawling) through webpages that offer indexing without human interaction, or from human-analyzed directories, or a combination of both algorithms. Some search engines use the services of other search engines to accomplish their job, by search through the collective gleanings of other search engines. Some such metasearch engines are free (such as Dogpile, [www.dogpile.com](http://www.dogpile.com)), while others are fee-based options (Copernic, [www.copernic.com](http://www.copernic.com)).

The number of pages available to a search engine is a common way to rate

the engine and to tout the thoroughness of a search. This criterion may be a little misleading, as indicated by the characteristics of the engine and the searching method. Typical current claims include the following:

- Google - 4.28 billion pages.
- AllTheWeb - Over 3 billion pages.
- Teoma - Over 1.5 billion pages.
- AltaVista - Over 1 billion pages.

In addition to the indexes developed by spiders and humans, many indexes are fed by "paid inclusion;" that is, including a citation because the originator very much wants it to be included. In some cases inclusion is only the beginning; for a fee, your page may be have a guaranteed or prioritized listing in the index. Obviously, much of this material is of a commercial nature, but still may be of interest to a searcher. Also, this "paid" portion of the index may finance the "free" portion. Yahoo uses this method to augment their database, while Google and AskJeeves have avoided the method.

Marketers have also discovered and are exploiting the search feature of the Web. Marketing research has shown that search engines play a major role in pointing Internet users toward specific products and services. With a handful of low-cost methods, smaller businesses can yield higher rankings for online searches than their corporate competitors. An estimated 135.1 million unique users accessed the Internet from work and home in September 2003, according to Nielsen/NetRatings. Consequently, using the Net as a marketing tool only makes commonsense.

By properly writing the text, it is assured that the unique HTML for the page will maximize the search engine visibility of that item. Considerable assistance can be provided by a pioneer in search engine writing techniques, SuccessWorks Search Marketing Solutions Inc. ([www.searchenginewriting.com](http://www.searchenginewriting.com)). Also, considerable insight into the marketing situation is gained from Marketleap.com ([www.marketleap.com](http://www.marketleap.com)), a search engine marketing firm specializing in paid inclusion.

# NONWOVEN NET

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The search engine companies are all very busy trying to add features and services to augment the basic searching function. For example, Google has quietly carried out a pilot study of noting the locality of the searcher and then including some advertisements from business in that specific locality. It is not yet known whether they will move this service to their entire system, but it could be a real cash generator.

Another company (Eurekster Inc., San Francisco, CA) is trying to personalize searching by offering a feature wherein the search engine will note a site that the searcher returns to frequently; this site then comes to the top of the list provided the next time the user searches the same subject. Several other forms of "personalizing" the search function are being investigated. Google has its "Froogle" shopping search service and its "Orkut" social-networking site, and is also preparing an E-mail service.

The bottom line in searching and search engines is that the process is a little like buying a car; its best to try it out and see how it fits. When you have made your selection, quickly learn how to turn on the lights, and get intimately familiar with all of its functions. Also, more information (probably more than you want) can be obtained rather easily (see [www.searchenginewatch.com](http://www.searchenginewatch.com)).

## **SPEAKING OF SEARCHING AND BROWSING**

Although Microsoft's Internet Explorer is probably the most widely used Web browser, it may not be the most useful tool, especially when compared to some of the more recently developed browsers.

An interesting new feature on some browsers has been dubbed – the tabbed browser. With the tabbed browser, it is possible to keep multiple Web pages open and the same time and on the same screen. Only one page is active and visible at a time, but the others are identified by a row of tabs, usually at the top of the monitor screen. A click on

one of the tabs switches from the active screen to another screen, which now becomes the active screen. This new page appears almost instantly, as it has already been downloaded.

This improvement is really quite a fundamental step forward, as it is possible to navigate amongst several Web pages with great facility. It is a little like picking a needed file from a packed file drawer by reading the staggered tabs that protrude from the top of the files.

With tabbed browsing, you can open all of your most-visited bookmarks or favorite sites with one click. They could remain open all day, updating in the background. You can view them at any time and in any order, by just clicking. When you desire, you can also open a new Web page or link in a new page you want to set up with a tab of its own. Also, you can open a set of favorite sites with a single click.

Tabbed browsing is especially great with slow dial-up connections, where waiting for a new page to load can be irritating. But it is even a help with broadband connections.

There are a number of choices among tabbed browsers, and most also offer other browser improvements, such as a built-in popup blocker. Best known are Netscape, Opera and Mozilla for both Windows and the Mac. Other tabbed browsers on Windows include Avant and Secure IE. On the Mac, tabbed browsers include OmniWeb 5 and Camino. All can be downloaded from the Web.

NetCaptor, for Windows, has been around for some time. It allows you to refresh all the pages or close them all at once, name them as desired, and move them from the top of the screen to the bottom. With this program it is possible to assemble a selection of tabbed pages into a single group, which can be opened at one time. There is also a two-click "Clean Up" feature that erases the traces of where you've been on the Web. There's even a built-in translation feature that takes you to a service where you can get rough translations of Web pages to and from English and most

other major languages.

NetCaptor can be downloaded at [www.netcaptor.com](http://www.netcaptor.com).

## **USEFUL WEB SITES**

It seems that everyone has stumbled upon a Web site that very quickly became a favorite. Sometimes it is very useful, and sometimes it is just downright interesting and worth an occasional visit. Perhaps you can find just such a Web site amongst the following.

- Time OnLine – There are several sites that offer a check on the exact time. It really all depends upon how exact you want your time. The Official U.S. Time site is a great place to get the right time, within 0.3 second. Also, the borders of U.S. time zones are delineated, along with an indication of which global areas are in daylight and which are in nighttime. The address is also easy to remember - [www.time.gov](http://www.time.gov).

A more extensive global picture of time is given by a commercial site: [www.timeticker.com](http://www.timeticker.com). If you are into GPS (Global Positioning System), you will probably want to visit the site that provides detailed information on this technology. It is also the official source of the time for the Department of Defense as well as another time standard for the United States - <http://tycho.usno.navy.mil/>. If you are interested in synchronizing your computer's clock, try a visit to the National Institute of Standards and Technology - [www.boulder.nist.gov/timefreq/](http://www.boulder.nist.gov/timefreq/).

- Science and Technology – This site is a treasure for many things that would interest the inquiring mind of a researcher. It draws on much of the resource material us in the TV series of Nova and Frontline, the mainstays of science and technology on Public Broadcasting System (PBS). Much of this material is educational, but in a very broad and useful sense of the word - [www.pbs.org/science/](http://www.pbs.org/science/).

- Weather – This is a topic that is frequently on everyone's mind since everyone is impact to one degree or another (that's a pun). Again, the government provides some excellent

resources. The National Weather Service provides detailed (really detailed) information on the weather in just about any location, as well as historical data that is useful - <http://iwin.nes.noaa.gov/> . If you want a somewhat quicker and simpler answer to the question, "What's the weather going to be?," a related but different section of the National Weather Service offering may be just what you are looking for - [www.nws.noaa.gov](http://www.nws.noaa.gov) . Another useful site when you are interested in the weather and enjoy excellent graphics is - [www.accuweather.com](http://www.accuweather.com) . This site offers an hour-by-hour local forecast for many areas.

- Chemistry – This topic has a multitude of sites, covering an array of general and specific fields of interest. The Division of Chemistry of the National Science Foundation (NSF) site is very interesting. One of the new features describes the "Approaches To Combat Terrorism."

This site is also the gateway to many federal grants, fellowships and other government funding sources, so it become quite familiar in the academic sector. - [www.nsf.gov/home/mps](http://www.nsf.gov/home/mps) .

The American Chemical Society's CAS (Chemical Abstracts Service) claims to be "the most complete and effective digital information environment for scientific research and discovery," a claim that can be defended. CAS now offers more than 22 million documents from 40,000 scientific journals (including INJ), with many of the journals going back to 1907. Also, this service includes the CAS Registry, patents, conference proceedings and more - [www.cas.org](http://www.cas.org) .

- British Textile Technology – Textile technology centered in the UK is covered very well by the British Textile Technology Group and their Web site. This Group includes the former Shirley Institute, WIRA and other textile groups. The site has a useful glossary of textile terms, a limited number of links to other textile sites, training courses, listing of services and facilities; it also includes activities in the nonwovens area -

<http://www.bttg.co.uk/dept/non-woven.htm> .

- Politics – With the coming flurry of activities on the political front, the Web provides sources of information and dis-information, along with factual material and a few laughs. One site that can actually be useful is Vote-Smart.org. This site covers primaries in all the states, and may be useful in learning how to register to vote, location of polling places, etc. Your state and ZIP code will allow you to focus on your specific needs. This site also links to candidate sites, which may not be quite so factual - [www.vote-smart.org](http://www.vote-smart.org) .

A somewhat similar site provides a table showing candidate positions on a number of important issues; the position is given in the words of the candidate, so – *caveat emptor*, buyer beware – ([www.congress.org](http://www.congress.org)).

If your interest tends to special interests, another site offers quick information on how much financial contributions come from what type of industries, and how much is coming from out of the candidate's own state - [www.tray.com](http://www.tray.com) .

- Dictionaries – There are many sites covering a variety of dictionaries on the Web. One of the most authoritative is the venerable Merriam-Webster Dictionary and Thesaurus, with a selection of other features - <http://www.m-w.com> – Dictionaries of Foreign Languages, Multilingual Dictionaries, specialty English dictionaries, Thesauri and other vocabulary aids, along with Language identifiers can be a very useful site. Along with an index of dictionary indices and on-line grammars, it has a selection of linguistic fun. It covers over 150 different languages - <http://www.yourdictionary.com> .

For those interested in etymology (the study of words), the A Word A Day (AWAD) is a very entertaining source of a daily tidbit on words - [www.awordaday.com](http://www.awordaday.com) – INJ

# ASSOCIATION BULLETIN BOARD

## 2ND ANNUAL INTERNATIONAL ISTANBUL TEXTILE CONGRESS

The Textile Engineering Department of the Istanbul Technical University (ITU) is presenting the Annual International Istanbul Textile Congress in Turkey in April. This is the second year for this conference and exhibition, presented by the foremost textile institution in the Middle East.

Although the Textile Engineering Department has existed for only a little more than 50 years, the ITU is over 270 years old, and holds a prestigious position in its area.

Topics covering in the technical conference include, the special position of wool fibers in Turkey, Textile dyeing and finishing, technical textiles, textile quality control, textile management and marketing.

## INDA PUBLICATIONS FOR 2003

There have been a number of new publications added to the library that INDA offers to the nonwovens industry. Some of these are conference proceedings, and several are exclusive industry publications that are generated within the INDA organization. All of them are potentially useful to nonwoven researchers and technologists.

Here are the new titles for 2003:

- Air Laid Pulp Nonwovens Primer.
- Hydroentangling Technology Primer.
- Analysis of NW Industry in North America (2002 Statistics).
- Analysis of NW Industry in Mexico

(2002 Statistics).

- Statistics Combination - North America, Mexico and Worldwide.
- Vision 2003 Conference Proceedings.
- Nonwovens Enhancements 2003 Proceedings.
- International Nonwovens Technical Conference (INTC 2003) Proceedings.
- Filtration 2003 Conference Proceedings.

For further information on purchasing these items, please contact: Brooke Boyle, at INDA headquarters; [bboyle@inda.org](mailto:bboyle@inda.org).

## VOTING BEGINS FOR IDEA04 ACHIEVEMENT AWARDS

The nominations are in, the finalists have been chosen and the voting has begun to select the recipients of the prestigious IDEA04 Achievement Awards.

Throughout the entire month of March nonwovens professionals from around the world will be able to vote online at both [www.nonwovens-industry.com](http://www.nonwovens-industry.com) and [www.inda.org](http://www.inda.org) for their selection in each of five Achievement Awards categories.

Designed to recognize new product introductions in nonwovens and engineered fabrics since IDEA01 in 2001, the IDEA04 Achievement Awards are co-sponsored by Nonwovens Industry magazine and INDA, Association of the Nonwoven Fabrics Industry and the organizer of the triennial IDEA04 International Engineered Fabrics

Conference and Exposition. IDEA04 will be held April 27-29, 2004 in Miami Beach, FL.

The IDEA04 Achievement Awards will be presented in five categories – Raw Materials/Fibers, Roll Goods, Machinery/Equipment, End Use-Short Life, End Use-Long Life. Nominations were accepted in these five categories throughout late 2003 and last month a selection committee chose three finalists in each category.

Like the inaugural IDEA Achievement Awards presented at IDEA01, the IDEA04 Achievement Awards will recognize the leading companies, individuals and new products in the global engineered fabrics industry. The awards will be presented during the April 28 Keynote Presentation at IDEA04.

The three finalists in the five categories are:

### Raw Materials

Fibervisions: Fine Fibers  
H.B. Fuller: HydroLock  
Xtreme Fibers: Short cut Hyflon MFA

### Roll Goods

Ahlstrom: Cytosep PS 2  
DelStar: DelPore Filter Media  
Dupont: Suprel

### Machinery/Equipment

Amotek: Amotek FB Flow Bagger  
Fleissner: Aqua-Jet with Oscillating Jets  
Sonobond Ultrasonics: RingMaster

### End Use-Short Life

Kimberly Clark: Huggies Convertibles Diaper-Pants  
Procter & Gamble/Unicharm: Swiffer Dusters  
Unilever: Dove Essential Nutrients cleansing Pillows

### End Use-Long Life

3M: Filtrete Ultra Home Furnace Filter  
BBA Fiberweb: Typar House Wrap  
Cuno: DuoFlo Filter Element

In addition to these five categories,

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two other IDEA04 Achievement Awards will be presented.

- The IDEA04 Entrepreneur Achievement Award, for the company founded since IDEA 01 that has made a significant impact on the engineered

fabrics industry.

- The IDEA04 Lifetime Achievement Award will be presented to former INDA president and long-time industry executive Ted Wirtz, who retired late last year.

For more information on the IDEA04 Achievement Awards, contact project coordinator Michael Jacobsen at 201-612-6601; [mjacobson@inda.org](mailto:mjacobsen@inda.org). — *INJ*

## A GREAT IDEA FOR THE TECHNICAL COMMUNITY

The three most important days on the 2004 calendar for anyone involved in nonwovens and engineered fabrics are right around the corner, and there is an extra bit of anticipation surrounding the IDEA04 International Engineered Fabrics Conference and Exposition this year.

All the excitement is because IDEA04, organized by INDA, Association of the Nonwoven Fabrics Industry, has been expanded to include technical textiles. This aggressive expansion was made at the request of IDEA attendees and exhibitors, many of whom are involved in both markets. The early response indicates the expansion has been extremely well received.

The dates are **April 27-29, 2004** and the location is beautiful, cosmopolitan **Miami Beach, Florida**. For those three days the Miami Beach Convention Center will become the center of our business world as more than 7,000 professionals from more than 60 countries descend on this international, multi-cultural city.

They will be greeted by more than 300 exhibitors showcasing everything from fibers, chemicals and raw materials to roll goods to the machinery and equipment that make the most advanced technical fabrics the world has ever known. These exhibitors will come from every corner of the world, from wherever nonwovens and engineered fabrics are made and used.

For more than three decades the triennial IDEA Conference and Exposition has brought together the suppliers, converters and end users of these advanced fabrics. The goal of the trade show is to provide an atmosphere where the business of nonwovens and engineered fabrics can be done. R&D professionals can touch and feel existing product and have discussions on where these products can go from here.

IDEA04 brings together the technical community from all links in the supply chain for the three-day Conference that will feature more than 40 technical papers. These will focus on developments in the manufacturing of technical textiles and nonwovens, along with presentations from end users explaining what they are looking for in 21st Century engineered fabrics.

INDA is making sure the word is spread about the expansion of IDEA04. A direct marketing campaign unprecedented in the long history of the show is reaching out to end

users and suppliers in all segments of the target markets. More than 140,000 direct mail pieces have been distributed to welcome everyone to IDEA04. Particular attention has been paid to buyers and researchers in automotives, filtration, geotextiles, home furnishings, hygiene, medical, protective apparel, fuel cells, and consumer products and wipes. No one is being left out.

Of course, IDEA04, like any trade show, is about much more than just the exhibits and the technical papers. Since this will be the one time in 2004 when every aspect of the nonwovens and engineered fabrics community -- suppliers, converters, end users, researchers, media, academia and consultants -- will be in one place at one time, there promises to be unparalleled networking opportunities. INDA is making sure of that through a host of special events designed to bring people together in an informal, easy-to-do-business atmosphere.

One of the highlights of IDEA04 will certainly be the presentation of the prestigious IDEA04 Achievement Awards, honoring new product and technical developments since IDEA01 (see previous article). These awards will recognize companies in five different categories — Short-Life End Product, Long-Life End Product, Raw Materials/Fibers, Equipment/Machinery and Roll Goods. In addition, an IDEA04 Entrepreneur Award will be presented to a new IDEA exhibitor formed since IDEA01.

A very special part of the IDEA04 Achievement Awards will be the presentation of the IDEA Lifetime Achievement Award to former INDA president and long-time nonwovens industry executive Ted Wirtz, who retired last year after six years at the helm of the world's largest nonwovens industry trade association and a more than 30-year career in nonwovens.

All of this all takes place in Miami Beach, Florida, one of the most exciting places in the world – South Beach, golf, fishing, professional sports, great restaurants and entertainment – that promises to make the trip more than just business.

**[www.idea04.com](http://www.idea04.com)**

# NONWOVENS CALENDAR 2004

## March 2004

Mar. 21-25 Association of Operating Room Nurses 51st Congress. San Diego Convention Center, San Diego, CA, USA. For more information, contact: Association of periOperative Registered Nurses, Inc., 2170 South Parker Road - Suite 300, Denver, CO 80231-5711, USA; Tel.: 303/755-6300; 800/755-2676; Fax: 303/752-2044. Name changed from Association of Operating Room Nurses. Web site: <http://www.aorn.org>

Mar. 30- April 2 Techtextil North America; Hightex – It's Our Future (TTNA). International Trade Fair for Technical Textiles and Nonwovens. Cobb Galleria Centre, Atlanta, GA, USA. For more information, contact: Messe Frankfurt Inc., Atlanta, GA; Tel.: 770/984-8016; Fax: 770/984-8023; Web site: [www.usa.messefrankfurt.com](http://www.usa.messefrankfurt.com)

## April 2004

April 19-23 World Filtration Congress 9 and 17th Annual American Filtration & Separations Society Conference and Exposition. Hyatt Regency Hotel, New Orleans, LA, USA. For more information, contact: AFS, Falls Church, VA; Tel.: 703/538-1000; Fax: 703/538-6305; Web site: [www.afssociety.org](http://www.afssociety.org)

April 22-24 2nd International Istanbul Textile Congress. The Marmara Hotel, Istanbul, Turkey. For more information, contact: IITC 2004 Secretarial Office, Cumhuriyet cad. No. 173/7, Elmadag 34373, Istanbul; Tel.: 0212/232-4885; Fax: 0212/232-4889; Internet: <http://222.iitc2004.com>

**April 27-29 IDEA 2004 International Engineered Fabrics Conference & Expo. Miami Beach Convention Center, Miami Beach, FL. For more information, contact: INDA, P.O. Box**

**1288, Cary, NC; Tel.: 919/233-1210; Fax: 919/233-1282; Internet: [www.inda.org](http://www.inda.org)**

## May 2004

May 11-13 2nd International Conference on Technical Applications of Textile Materials, ApliMatec 2004. Valencia, Spain. For more information, contact: ApliMatec; Tel: 34+963/861-442; Fax 34+963/861-155. Internet: [www.apli-matec.com](http://www.apli-matec.com)

May 18-20 INDA Nonwovens Training Course. INDA Headquarters, 1200 Crescent Green, Suite 100, Cary, NC, 27511, USA. For more information, contact: INDA, P.O. Box 1288, Cary, NC; Tel.: 919/233-1210; Fax: 919/233-1282; Internet: [www.inda.org/events](http://www.inda.org/events)

May 18-20 Fiber Society 2004 Spring Symposium. Radisson Clayton Hotel, St. Louis, MO, USA. The Symposium them is AFibers, Fibrous Structures and Filtration@. For more information, Dr. K. J. Choi ([kchoi@aafintl.com](mailto:kchoi@aafintl.com)) or Prof. Da-ren Chen ([chen@me.wustl.edu](mailto:chen@me.wustl.edu)). Internet: [www.thefibersociety.org](http://www.thefibersociety.org)

May 23-27 83rd World Conference - The Textile Institute. Donghua University, Shanghai, P. R. China. For further information, contact 83rd TIWC Secretariat at the College of Textiles, Donghua University, Shanghai 200051, P. R. China; Fax: 86-21/621-93061; Email: [ti04shanghai@dhu.edu.cn](mailto:ti04shanghai@dhu.edu.cn). Internet: <http://www.dhu.edu.cn/83tiwc.htm>

May 24-25 OUTLOOK 2004 Conference. Grove Park Inn, Asheville, NC. Co-sponsored by the Narrow Fabrics Institute (NFI) and the United States Industrial Fabrics Institute (USIFI), divisions of the Industrial Fabrics Association International (IFAI). For more information, contact: Karen

Musech, NFI Managing Director, Tel.: 651/225-6948; Internet: [kemusech@ifai.com](mailto:kemusech@ifai.com); also, [www.ifai.com](http://www.ifai.com)

## June 2004

June 3-4 EDANA International Nonwovens Symposium.. World Trade Center, Barcelona, Spain. For additional information, contact: Mr. Philip Preest, Marketing Manager, EDANA, 157 Avenue Eugene Plansky, B-130 Brussels, Belgium; Tel.: 32+2/734-9310; Fax: 32+2/733-3518; [www.edana.org](http://www.edana.org)

June 6-11 INDA Nonwoven Product Development Course. INDA Headquarters, Cary, NC and North Carolina State University, Raleigh, NC. For more information, contact: INDA, P.O. Box 1288, Cary, NC; Tel.: 919/233-1210; Fax: 919/233-1282; Internet: [www.inda.org/events/traincs/productworkshop.pdf](http://www.inda.org/events/traincs/productworkshop.pdf)

June 21-25 INDA Spunbonding & Meltblowing Fundamentals in Nonwovens . INDA Headquarters, Cary, NC and North Carolina State University, Raleigh, NC. For more information, contact: INDA, P.O. Box 1288, Cary, NC; Tel.: 919/233-1210; Fax: 919/233-1282; [www.inda.org/events/traincs/productsunbrochur.pdf](http://www.inda.org/events/traincs/productsunbrochur.pdf)

June 22-24 Autex 2004 Conference. Roubaix, France. AUTEX, the Association of Universities for Textiles is an international organization

## August 2004

Aug. 10-12 INDA Nonwovens Training Course. For more information, contact: INDA Headquarters, 1200 Crescent Green, Suite 100, Cary, NC, 27511, USA. Aug. 23-27, 2004. INDA Fabric Properties and Characterization Training Course. INDA/NCSU, Cary, NC. For more information, contact: INDA, P.O. Box 1288, Cary, NC; Tel.: 919/233-1210; Fax: 919/233-1282; [www.inda.org/events](http://www.inda.org/events)

# NONWOVENS CALENDAR

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## September 2004

Sept. 18-17 ATME-I. Palmetto Expo Center, Greenville, SC. The American Textile Machinery Exhibition-International. For more information, contact: ATME-I, Greenville, SC. Tel: 864/331-2277; Fax: 864/331-2282. Internet: [www.atmei2004.com](http://www.atmei2004.com).

Sept. 20-23 International Nonwovens Technical Conference (INTC 04). Westin Castle Hotel, Toronto, Canada. The INTC 04 meeting will be held in Canada for the first time. For more information, contact: INDA, P.O. Box 1288, Cary, NC; Tel.: 919/233-1210; Fax: 919/233-1282; Internet: [www.inda.org/events/](http://www.inda.org/events/).

## October 2004

Oct. 10-14 INSIGHT 2004. Hotel Hilton Austin, Austin, TX. For more information, contact: Marketing Technology Service, Inc., 4100 South 7th Street, Kalamazoo, MI 49009; Tel.: 269/375-1236; Fax: 269/375-67101; Internet: [www.marketingtechnologyservice.com](http://www.marketingtechnologyservice.com)

Oct. 11-13 2004 Annual Fiber Society Meeting and Technical Conference. Cornell University, Ithaca, NY. A symposium on AAdvanced Materials and Processes@ will be held in conjunction with this meeting and conference. For more information, contact Professor Kay Obendorf ([sko3@cornell.edu](mailto:sko3@cornell.edu)) or Professor Anil Netravali ([ann2@cornell.edu](mailto:ann2@cornell.edu)). Internet: [www.thefibersociety.org](http://www.thefibersociety.org).

Oct. 25-27 INDA Needle-punch Conference. Savannah, Georgia. This conference will have a New Technology Showcase. For more information, contact: INDA, P.O. Box 1288, Cary, NC; Tel.: 919/233-1210; Fax: 919/233-1282; Internet: [www.inda.org/events/](http://www.inda.org/events/).

Oct. 27-29 IFAI Expo 2004. David L. Lawrence Convention Center in Pittsburgh, PA. For more information, contact: IFAI, Roseville, MN; Tel.: 651/225-6942; Fax: 651/631-9334. E-mail: [confmgmt@ifai.com](mailto:confmgmt@ifai.com). Internet: [www.ifaiexpo.info](http://www.ifaiexpo.info). A conference enti-

led AMedical Textiles@ will be held on Oct. 27-26, 2004, in connection with this Conference.

## November 2004

Nov. 1-5 INDA Automotive Product Development Training Course. INDA/NCSU, Cary, NC. For more information, contact: INDA, P.O. Box 1288, Cary, NC; Tel.: 919/233-1210; Fax: 919/233-1282; [www.inda.org/events](http://www.inda.org/events).

Nov. 16-18 INDA Nonwovens Training Course. INDA Headquarters, 1200 Crescent Green, Suite 100, Cary, NC, 27511, USA. For more information, contact: INDA, P.O. Box 1288, Cary, NC; Tel.: 919/233-1210; Fax: 919/233-1282; Internet: [www.inda.org/events](http://www.inda.org/events).

Nov. 18-20 13th Annual TANDEC Nonwovens Conference. University of Tennessee Conference Center, Knoxville, Tennessee. For more information, contact; TANDEC Conference Textiles and Nonwovens Development Center, The University of Tennessee, Knoxville, TN 37996; Tel: 865-974-6298; Fax: 865-974-3580; Internet: <http://tancon.utk.edu>.

## December 2004

Dec. 5-9 Consumer Specialty Products Association Annual Meeting. Fort Lauderdale, Florida, USA. For more information, contact: Consumer Specialty Products Association, 900 - 17th Street, Washington, D.C. 20006. Tel.: 202/872- 8110; Fax: 202/872-8114. [www.cspa.org](http://www.cspa.org).

Dec. 7-9 Filtration 2004. Pennsylvania Convention Center, Philadelphia, PA. Major conference and exposition covering all aspects of the filtration business. For more information contact: INDA, P.O. Box 1288, Cary, NC; Tel.: 919/233-1210; Fax: 919/233-1282. Internet: [www.inda.org](http://www.inda.org).

## March 2005

Mar. 20-22 INDA Annual Meeting. Hyatt Regency Grand Cypress Resort, Orlando, FL. For more information, con-

tact: INDA, P.O. Box 1288, Cary, NC; Tel.: 919/233-1210; Fax: 919/233-1282; Internet: [www.inda.org/events](http://www.inda.org/events).

## November 2005

Nov. 15-17 Filtration 2005. Navy Pier, Chicago, IL. For more information, contact: INDA, P.O. Box 1288, Cary, NC; Tel.: 919/233-1210; Fax: 919/233-1282; [www.inda.org/events](http://www.inda.org/events) — INJ