SHOCK AND AWE

By Dr. D.K. Smith, Ph.D., Smith, Johnson & Associates
Co-editor, International Nonwovens Journal

Dr. D.K. Smith is the most recent recipient of the INDA Lifetime Technical Achievement Award. This editorial is excerpted from his comments made upon acceptance of this award at the recent INTC Conference in Baltimore, Maryland.

I want to thank the Technical Advisory Board of INDA for this Lifetime Technical Achievement Award. I am truly humbled by the award. I am deeply grateful and delighted to be acknowledged by a group I hold in such high esteem. Especially I remember others in prior years who have been honored by INDA and TAPPI awards in this category. Most of them have been close friends and associates whom I admire very much. I am also sincerely grateful for so many friends and colleagues within the industry and academia who have helped, encouraged and mentored me over the past many years. The past Technical Conferences and those who have attended have had a real impact on my life and made my career both exciting and enjoyable.

I am delighted to be with this group today. In reviewing the quality of the papers that have been given and are scheduled for presentation, the variety in the New Technology Showcase presentations, as well as the Tabletop Exhibition, I can't help but recall a memorable meeting I had just a decade ago. The meeting was with Dr. Carlyle Harmon in his home in Provo, Utah. Some of the old timers here may recall him as the Vice President for Research of the Chicopee organization of Johnson & Johnson. He directed the Chicopee nonwovens research effort during its formative years when the industry was small and research advances were made by a short list of companies.

In those early days, the nonwoven producers had to develop the product concept, the process for producing the product, the equipment and engineering for scaling up the process to commercial manufacture, and then carry out all of the marketing activities. During our meeting, Dr. Harmon was anxious to hear about the status of the nonwoven industry and technology, as he had been removed from these developments for about 20 years. I described for him the size of the various segments of the industry, the production lines that had been installed in various parts of the world, the growth and diversity of the many commercial products based on nonwoven materials. He frequently interrupted me to exclaim, "Is that right?" or "That's amazing," with an occasional "That's hard to imagine."

Dr. D.K. Smith (left) accepts congratulations on receiving his INDA Lifetime Technical Achievement Award from fellow INJ co-editor Rob Johnson during the INTC Conference last September in Baltimore.

His reaction of "shock and awe" at the progress of the business and the technology, and the tremendous advances that had been made in so many segments of the nonwovens industry caused me to pause and reflect. Much had been accomplished in those two decades. He was a leader with a great deal of foresight, but he was still amazed at all of the advances, the developments, the improvements, the science and technology, and all the growth that had occurred.

As I look at INTC 2003, I have somewhat the same feelings as my friend, Dr. Harmon. The past decade has provided another major advance in all aspects of the industry. Production facilities are truly distributed worldwide. Progress in new science and technology has been remarkable. The new nonwoven products and the resulting converted products introduced in recent years offer an amazing palette of diversity, utility and innovation. It seems that every segment of the business has experienced a remarkable progress, growth and stimulation.

New companies and new people have entered the industry. Academic research has accelerated, based on flexible pilot and process lines. New science has been introduced and older methodology has improved. Those of you who are new to the industry may not appreciate it, but I think that those of us who have been around for awhile can be forgiven for a sense of "shock and awe."

My sincere hope is that all of this will continue! — ***INJ***

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WORLDWIDE ABSTRACTS AND REVIEWS

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

Novel textile technology is based on a natural phenomenon

Schoeller Textil AG's new nanosphere textile impregnation process is based on the self cleaning principle that stops dirt adhering to lotus leaves or insect wings. Nanoparticles applied to textiles by sol-gel techniques create a finely structured surface to which water, oil or dirt particles can not adhere. Spillages can be rinsed off with water. Nanosphere applications include the clothing, home textile, automotive and medical sectors. Textiles are being developed that remain clean and also reject odours such as cigarette smoke, with others able to release agreeable odours. Schoeller is also developing phase change products based on materials that are micro-encapsulated into foams laminated to the reverse side of textiles. The ComforTemp textiles allow excessive temperatures to be evened out by absorbing or releasing thermal energy.

Author: Anon
Source: Allg. Vliesstoff-Rep.
Issue: no. 4, 2003, p. 19 (In German)

Textiles and fibres: fibres extracted from bamboo shoots, sheaths

US Patent application, US20030056484, is for a process developed by Katsuyama Technos, Japan, to make yarns and cloth, using bamboo fibres from the sheaths of bamboo shoots. These are usually disposed of. The bamboo shoots are fibrillated, producing fine fibres and these can be spun. Alternatively the cellulose in the bamboo sheaths is obtained using chemical treatment. The resulting cellulose fibre can be spun. The bamboo fibres can be blended with natural fibres such as cotton, linen, silk or wool; synthetic fibres like nylon; or regenerated fibres such as viscose rayon. Textiles made from bamboo fibres are quick drying and breathable and can be used for items such as pyjamas, bed linen, and underwear.

Author: Anon
Source: New Mater. Jpn
Issue: July 2003, pp 4-5

Western Europe: nonwoven production up 8%

The production of nonwovens in Europe increased by 7.8% in 2002, reaching 1.2mt, compared with a growth in 2001 of 4.3%. The fastest growing production processes were the spunlace and spunlaid/SMS processes, while the main end use for nonwovens remains the hygiene market with a 32.8% share of deliveries, or 390,500t. European nonwovens production growth at 7.8% exceeded both that of North America and Japan. The most important polymer used in the European nonwoven industry continues to be polypropylene, either in fibre or chip or flake form, and accounts for 592,800t and 46.3% of total fibre and polymer chips consumption. The European nonwoven industry is estimated to employ 17,000 people. (Short article)

Author: Anon
Source: Tech. Text.
Issue: vol. 46, no. 3, Aug. 2003, p. E 100; 179d

Zimmer acquires Fleissner

German engineering and constructing company Zimmer AG, Frankfurt am Main, has bought the machinery company Fleissner GmbH und Co, Egelsbach, Germany with effect from 1st January 2003, subject to the approval of the German antitrust authorities. Machine manufacturing company Fleissner has its activities focussed on the areas of nonwovens, staple fibre plants and dryers with sales of Euro82m in 2002. This acquisition is a strategic move for Zimmer to secure its market position in the staple fibre plant contracting sector. Zimmer's portfolio will also be enlarged by activities in the fast growing nonwovens market. Fleissner holds a market share of about 40% in staple fibre plants and is one of the leading manufacturers of high performance production and finishing plants for the nonwovens industry. (Short article)

Author: Anon
Source: Tech. Text.
Issue: vol. 46, no. 3, Aug. 2003, p. E 101; 177d

Teijin Twaron: capacity 18,500tpy

Teijin Twaron BV, Arnhem, Netherlands, has expanded the Emmen plant for p-aramid fibre Twaron by 50%. 18,500tpy will become available. The maximum output will be limited to approximately 16,000 tons in view of the present streamlined product mix. Expansion projects in the monomers plant in Delfzijl was designed and built by a consortium of Teijin Twaron and Akzo Nobel Engineering, Tebodin Consultants and Engineers, and Stork Industry Services. The partners involved in the spinning plant in Emmen were Teijin Twaron, Aker Kvaerner Process, and Akzo Nobel Engineering. The new Teijin Technology Center Europe (TCE) in Arnhem became operational on 1 April 2003, not just for Twaron but for other Teijin products, including Technora, Teijinconex, carbon fibre, polyester and other fibres.

Source: Tech. Text.
Issue: vol. 46, no. 3, Aug. 2003, p. E 103; 187d

Laroche: new airlay machine

The new generation of airlay machines by Laroche SA, Cours La Ville, France, has been developed for the fabrication of mats up to 3,900mm with specific weights of 300-4,000gsm or more. This machine is suitable for all types of fibres. The airlaying machine comprises a single hopper feeder feeding the airlaying section with an even and stable mat of fibres, and a vibrating chute flow control system which guarantees an even product weight as well as one airlaying section with airflow control and recipe based automatic operator control. Production capacity reaches up to 2,000kg/h or more depending on the machine width and the product specification. Laroche also offers a complete system for waste recycling. The new Minitrim HSP opener with special clothing and feeding system allows following the line up to 450m/min for products from 15-300gsm. The three dimensional (3D) Web Linker for Napco Technology produces 3D nonwoven structures made of two or three fibrous laps or mats for composite products. It is available in working widths of 1.0m and 1.5m. Potential products include geosynthetics, thermal and sound insulation felts and structural pieces. The new Laroche-Herman process is a compact line for semicured resinated moldable felts. (Short article)

Author: Anon
Source: Tech. Text.
Issue: vol. 46, no. 3, Aug. 2003, p. E 107

Fleissner: new developments for the nonwoven industry

Fleissner GmbH und Co, Maschinenfabrik, Egelsbach, Germany will show some new developments in the field of machinery for the nonwovens industry at the ITMA. The AquaJET spunlace system for hydroentanglement now has lines of width up to 7,000mm for carded webs and spunbonds. The system also has lines for nonwovens such as flex hemp and particularly cotton. Cotton products include pads for the removal of make-up, webs of 30-300gsm for medical and cosmetic purposes and blends with synthetic fibres. A nonwoven material has been developed for cotton bale packing. The AquaJet spunlace system also incorporates the AquaPulp system for multilayer products, and spunlace systems for increased cross direction (CD) strength and regular surface structure. Spunbond and spunlace can be combined in the AquaSpun system while "From-Fiber-to-Web" technology allows the production of spunlaced nonwovens without a card or cross-lapper. A new water filtration system has also been developed. High performance through air dryers with one-drum or multi-drum configurations have perforated drums, drums with wire mesh covers or U-type profiles. These can have automatic transport through the dryer, althernating airflow, varting temperature zones or uniform temperature and flow profile across the web. At the ITMA Exhibition, Fleissner information will be available on lines for thermal bonding, spray bonding and chemical bonding with belt dryer or drum dryer; foam impregnation lines; heatsetting lines with width control; complete turnkey bonding lines for carded webs, spunbonds and airlaid webs; needle felt bonding lines for floor coverings, filters, geotextiles, roofing felts, for use in the automotive sector and nonwovens production lines for different industrial textiles. (Short article)

Author: Anon
Source: Tech. Text.
Issue: vol. 46, no. 3, Aug. 2003, p. E 108; 188d

Nonwovens for car interiors produced by aerodynamic processes

A new aerodynamic production process for nonwoven textiles has been developed by Trutzschler GmbH, Germany, to optimise the surface area to mass ratio and fibre orientation isotropy. The process has been tested on the laboratory scale by the Aachen Technical University's Institute for Textile Technology to determine the effect of different process parameters and to collect data for different process conditions, particularly air flow rates and pressures. A mathematical model has been developed to simulate the interaction of process variables. The fibre mix comprised 40% secondary polypropylene, 50% flax and 10% bicomponent fibres. The tests confirmed that the aerodynamic process offers economic advantages by providing lower mass, and more easily recyclable products with improved physical properties for interior automotive linings compared with existing materials. Turbulence and electrostatic related problems can be minimised by optimising air flow conditions. (2 ref)

Author: Paschen A
Source: Allg. Vliesstoff-Rep.
Issue: no. 4, 2003, pp 25-26 (In German)

Properties of selected mechanically bonded nonwovens

The physical behaviour of orthotropic nonwovens in which the cross machine contraction is greater than the machine direction elongation can be determined on tensile test equipment. The method is based on monoaxial test strips and allows their two dimensional behaviour to be characterised. The test strips are marked with a screen pattern in which the changing coordinates of individual points can be related to the cross directional contraction and machine direction elongation. The relationship is calculated using models based on Excel and Origin computer programs. (1 fig)

Author: Reiche D
Source: Allg. Vliesstoff-Rep.
Issue: no. 4, 2003, pp 43-44 (In German)

Simulation of acoustic properties of textile materials

The design of automobile interiors requires new form shaping and functional materials, which can be manufactured cost effectively. Polyester is an ideal raw material, which can be used to manufacture products for a wide range of applications. During the manufacture of polyester nonwovens, binding agents are not used, which means the material falls below the lower limit for fogging, emission and odour control.

Simulations of the properties of nonwovens must take into account variations in fibre properties, inhomogeneities in fibre blends and the smoothness of the surface. Thechniques used in manufacture, grammage, thickness and orosity are also relevant. Stochastic geometry models have been developed following the analysis of different types of nonwoven by confocal laser scanning and light microscopy. Sound absorption results from the flow resistance of air molecules at the absorbing skeleton and is related to the flow resistance. For the calculated geometry, the velocity area is calculated by the Stokes equation. The absorption of nonwovens is calculated by simulation of the microstructure followed by flow simulation. A special software package has been developed to select nonwovens based on frequency dependent absorption profiles. The simulation gives results within 5% of values obtained using a Kundt's tube. These processes have been used by Sandler, Germany, to develop products for the automotive industry. An advanced development of the nonwoven insulating material; sawabsorb has been developed which achieves similar acoustic absorption with less grammage. (6 fig, 22 ref)
Author: Hornfeck U
Source: Tech. Text.
Issue: vol. 46, no. 3, 22 Aug. 2003, pp E120-E122; 200-202d

13 new nonwoven products launched
New nonwoven products from Japanese manufacturers include Bond Tolnet Pad for carpet cleaning Japan Vilene KK, Chiyoda-ku, Tokyo; a cooking towel from Lion KK, Sumida-ku, Tokyo; a pet urine wipe and an alcohol-free pet wipe from Uni-Charm Petcare KK, Shinagawa-ku, Tokyo, Japan); the Tracy ultramicrofibre face wash cloth and the Anyany ultramicrofibre face oil remover cloth from Toray KK, Chuo-ku, Tokyo. The Suzuken Pure Sheet for users with sensitive skin is marketed by Suzuken KK, Azuma-ku, Nagoya, while Airrich, an allergen inactivating air cleaning system has been developed by Matsushita Ecosystems KK, Kasugai-City, Aichi. Plant cultivation systems include the eG-system from Matsushita Facility Management KK, Moriguchi-City and the Green Cube Mini for small space gardening from Ohbayashi-gumi KK, Minato-ku, Tokyo. Triangle Magic is a triangular shaped coffee pack from Toho Coffee KK, Konohana-ku, Osaka. The Air-Cotton and Katekin anti odour Sofi sanitary pad has beem launched by Uni-Charm KK, Minato-ku, Tokyo and an antibacterial towel compact box by Taisho Seishi KK, Shinjyuku-ku, Tokyo.
Author: Anon
Source: Nonwovens Rev.
Issue: vol. 14, no. 2, 2003, pp 30-32 (In Japanese)

Sansho Shigyo KK: nonwoven product My Claru for use in food preparation has superb water absorbency and retention due to its novel 3 layered structure
My Claru developed by Sansho Shigyo KK, Tosa-City, Kochi, Japan is a nonwoven product made from natural materials used in food preparation. It is composed of an inner layer of short fibre pulp and outer layers of long fibre rayon. This unique three layered structure results in superb water absorption and retention performance. It has high mechanical strength and is tear resistant even when wet conditions. My Claru can be used for wiping, oil/water drainage, marinating and as a food protector for freezing where it prevents discolouration. It can be peeled smoothly from frozen food when defrosted. My Claru is also washable and reusable and is therefore an environmentally friendly product. (2 fig) (Short article)
Author: Anon
Source: Nonwovens Rev.
Issue: vol. 14, no. 2, 2003, p. 38 (In Japanese)

Highly absorbent nonwoven cloth: new product from Oji Kinocloth
Oji Kinocloth Co Ltd, Japan, a subsidiary of Oji Paper Co Ltd, has developed a novel type of nonwoven cloth with three times the absorbency of a conventional nonwoven material. The company will promote use of the cloth in the manufacture of sanitary products, disposable nappies and other products. Hi-Cloth is made of pulp fibre and synthetics such as polyester, and can be used for many applications. 1g of the new material can absorb 20g of water. Sales are projected at JPY9bn for the current financial year ending March 2004, rising to JPN10bn within two years.
Author: Anon
Source: New Mater. Jpn
Issue: Nov.2003. p. 11

PR China: market trends for technical textiles
Consumption of Chinese technical textiles increased from 530,000t in 1988 to 2,081,000t in 2002. This averages out as more than 11%/y over the 14y. In 1988 the production of technical textiles accounted for 8% of total textile fibre consumption of 6.5mt, production of technical textiles has since increased year by year. The proportion of technical textiles to whole textile fibre consumption also gradually increased. It is estimated that the development of technical textiles will increase, to over 3m tpy in 2010. Tables show Chinese production of technical textiles by application, Chinese fibre consumption in technical textiles by material 2002 and Chinese nonwovens production by technology 2002. China's nonwoven industry is developing with production rising rapidly from 50,000t in 1988 to 633,000t in 2002. (3 tab) (Short article)
Author: Anon
Source: Tech. Text.
Issue: vol. 46, no. 3, Aug. 2003, p. E 98

US filters demand USD10bn
Demand for filters in the USA is expected to increase 4.7%/y to USD10bn in 2007, driven by many factors, including environmental regulations, a rebound in manufacturers' shipments and manufacturers' growing interest in water recycling processes, and motor car cabin air filters.
Author: Anon
Source: Tech. Text.
Issue: vol. 46, no. 4, Oct. 2003, p. 248 — ***INJ***

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RESEARCHER'S TOOLBOX

A Microscope For Everyone

Anyone who has worked with nonwoven fabrics for very long realizes that a microscope is an invaluable tool for such effort. The microscope need not be the most advanced model or a high power unit. In fact, most of the work on nonwoven structures can be done with a relatively low power microscope.

The scanning electron microscope (SEM) is extremely useful for studying very fine details, such as the surface detail of a single fiber. For much of the microscopic work of interest to the nonwoven specialist, the SEM is an overkill. The significant information can be obtained at magnifications of 10X to 50X.

Some years ago, Intel was briefly in the toy business with a low-cost digital microscope (less than $100). It could be connected to a computer, and provided some exciting times for a lot of youngsters. Even a few seasoned nonwovens researchers and product specialists purchased units at that price. Although the limitations were numerous it did provide a whole new world of insight for some researchers. This insight was sufficient that a few people took the next step and invested a considerable amount of money in a substantial microscopy setup, as this initial experience proved the value of this technology.

Now, an intermediate step can be taken. The low-cost, toy digital microscope can be upgraded to eliminate many of the limitations, without completely shattering the lab budget. For a little under a thousand dollars, a serious digital microscope is now available from Olympus America — the Olympus MIC-D.

This is a serious microscope product that is apparently aimed at the education market. It is an inverted microscope, with the lens and the video sensor mounted beneath the stage that accepts the slide or sample. A bright white LED directs diffused or focused light from above or below the specimen; alternately, the light can come from the side to emphasize surface textures with the oblique lighting.

Power for the unit is supplied from the USB port of a PC and the image is displayed on the PC monitor. This arrangement is a tremendous help when more than one person is viewing the sample, or where a record of the image is desired.

The magnification range of the unit is 22X to 255X, which is more than adequate for the typical study of fabric structure details. When a magnification at the high end of this range is used, the field of view become quite limited, and a lower magnification is generally beneficial. It is even possible to flip the microscope upside down to more easily study large surfaces.

The software for the unit allows the researcher to save photos or videos, using standard formats. Some editing and scaling of the image is also possible. A time-lapse mode can snap individual frames at regular intervals and then string them into a video presentation. Some optional accessories for the unit are also available, making sample preparation a little easier. However, the typical nonwovens researcher will quickly find means to expand the usefulness of this unit.

A fascinating gallery of photos covering a wide variety of specimens photographed with this unit is available on an Olympus web site (www.mic-d.com). While most of these photos are of a biological nature, there are some fiber examples as well. It is easy to image that a dedicated nonwovens researcher could quickly add a vast array of photogenic, interesting, and educational nonwoven specimens to this gallery.

This latest unit could be an extremely useful tool to add to a lab that does not presently have such capabilities and cannot justify a major investment.

Time And Money

An economist in England has developed a formula for converting the value of one's time into a specific amount of money.

After all, who hasn't struggled with the question: Is this worth doing myself, or should I have someone else do it.....or is it really worth doing?

A lot of this type of thinking is going into the question of 'outsourcing' these days. Can we do it cheaper on the outside, or should we keep in inside?

There are ramifications to such questions, but sometimes it's helpful to simply reduce the job to a simple cost. That sometimes, not always, makes the decision a little easier.

The equation developed by Economist Ian Walker of Warwick University in England is as follows:

V = (W [100 - t /100] / C

Where

V = the value of an hour,

W = one's hourly wage,

t = the tax rate,

C = local cost of living.

In his work, Professor Walker figured that the average British minute is worth just over 15 cents (U.S. cents) for men and 12 cents for women. He also figured than an hour for a man on average earnings in Britain is US$ 8.99. For women, the comparable figure is US$7.10.

Walker points out that with this kind of analysis, the real cost of any task is available. This can make for an easier decision as to (1) whether to do the project yourself, (2) whether to hire someone else to do the project; (3) forget the entire matter.

This approach can cover not only business-related item, but also personal decisions, according to Walker. Thus, the cost of a take-out meal versus eating in, or the cost of using a taxi instead of a bus.

For the researcher, this simple approach can be useful in a variety of actions, both professional and personal. Maybe a series of tests could be done more efficiently by an outside lab. Perhaps a new staff member versus our usual outsourcing is the most cost-effective approach. – *INJ*

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DIRECTOR'S CORNER

Use of Public Defibrillators Can Increase Survival Rates of Cardiac Arrest

It is seldom possible to select the locale for a cardiac arrest episode. The victim of such an occurrence can be considered very fortunate if the seizure occurs in a hospital, a clinic, a doctor's office or some other site where professional assistance is immediately available.

More often than not such an event occurs in much less ideal locations. Even the research laboratory or offices associated with the laboratory, or production and plant areas are not immune from the traumatic events that can surrounds such an occurrence.

Each year, about 250,000 Americans die from cardiac arrest, which can result from heart attacks, underlying heart disease or accidents, among other causes. While most such deaths happen in the home, roughly 20% occur in public places, such as the classroom or laboratory.

Unfortunately, about 95% of victims die even before reaching a hospital or location with professional care available. Paramedics can shock victims' hearts back to a normal beat withdefibrillators, but they rarely arrive in time. Every 60 seconds spent waiting for a paramedic lowers the chance of survival by about 10%.

The first major test of public-access defibrillators found that placing the devices in office buildings, shopping malls and other public places, along with the training of ordinary people to use them can double the chances of survival of cardiac arrest.

Defibrillators have become standard equipment, like fire extinguishers, in many airports, convention centers and health clubs. Although earlier studies suggested that such units in these circumstances are safe, there has been no clear proof until now that such devices in these circumstances can increase survival.

The latest study recently completed was intended to determine whether putting automated defibrillators, about the size of laptop computers, into the hands of ordinary volunteers could actually increase the chances of saving lives.

In this test, about 1,500 defibrillators were distributed to 993 sports facilities, shopping centers, entertainment venues, community centers, office buildings, factories, apartment buildings, transit centers and schools in 24 cities. About 20,000 volunteers who worked at those locations took part in the study. Half were taught to do cardiopulmonary resuscitation only. The remainder of the group were also shown how to work the defibrillators.

After almost two years into the study, there were 292 attempted resuscitation and 44 survivors among the volunteers who used defibrillators, and only 15 among those who performed CPR alone. Most victims in the study were in their 60s and 70s.

Dr. Joseph Ornato of Virginia Commonwealth University in Richmond presented the results recently at a meeting of the American Heart Association. "The bottom line is we believe defibrillators in public facilities will double survival, if there are trained teams to use them," he said.

Dr. Raymond Gibbons of the Mayo Clinic said he hopes the results will persuade more businesses to install defibrillators. "It potentially will have an enormous impact," Dr. Gibbons said of the study. "Hopefully, over time, this will save lives."

Epidemiologist Clay Mann of the University of Utah, who headed the project in his state, said the devices seem to be most useful in shopping centers, fitness clubs and other recreation areas where elderly people often congregate. The state of Utah, for example, has more than 2,000 trained volunteers to aid people during cardiac arrest by using a defibrillation machine. The national Public Access Defibrillation (PAD) group recently honored Utah for its participation in this and a companion study aimed at training non-medical personnel in public facilities to successfully carry out procedures of treating cardiac arrest.

"There are far more people in Utah prepared in an event of cardiac arrest," said Joy Erickson, a member of American Heart Association. Currently, more than 80 Utah public facilities are equipped with an Automatic External Defibrillator (AED) and an AED trained staff who can provide life-saving defibrillator shocks during cardiac arrests.

Maybe the time has come for consideration of a PAD in university and industrial research laboratories, and in appropriate plant and office locations. More information - Cardiac Science, Tel.: 866/289-5649; Internet: www.cardiacscienceaeds.com .

Improving Laboratory Operations

Along with keeping the researcher and the product development specialist up-to-date on the latest science and technology, a wise laboratory administrator must keep a watchful eye out for ways to keep the laboratory facilities and operations up-to-date as well.

A good laboratory fume hood can be a very useful facility in the nonwovens laboratory which gets involved in a wide variety of research projects. In a lot of labs, the hood that was originally installed in the laboratory is out-of-date, and frequently operating at much lower than its original, rated efficiency. A very useful way to check the performance of the lab hood, and to ensure that it is doing the required job, is to use a hood monitor that measures the face velocity of the air sweeping through the hood.

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AirGard lab hood monitors by Alnor Products are available in a range of models, from simple go/no-go monitors to a full-featured version with a digital display of the actual measured velocity. Lab Hood Monitors continuously monitor lab hood face velocity by measuring the air velocity of clean air from the room passing through the air inlet on the front of the monitor. Maintaining an adequate face velocity is critical for containment of hazardous substances that may be present in the lab hood.

When the face velocity drops below a user-determined level, the AirGard Lab Hood Monitors activate an audible alarm, visual alarm, and relay output. Some monitors indicate low face velocity with a red LED and an audible alarm. The AirGard 335 Monitor also has a digital bar graph to indicate face velocity conditions, an optional digital velocity display to aid in the diagnosis of problem face velocities, and a high flow alarm to help detect excessive air velocity. In addition, all AirGard Lab Hood Monitors can report unsafe face velocity conditions to other personnel in a remote location by means of a relay output.

Installation and set-up of the Alnor AirGard Lab Hood Monitors is simple and quick. Two models are flush mounted. One model (405 Monitor) is a surface-mounted version ideal for retrofitting existing lab hoods.

These monitors comply with the recently released ANSI Z9.5, SEFA 1.2, and NFPA 45 standards. Alnor Products; TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126.

If an older hood really needs to be replaced, modern, well-designed replacement hoods are the answer. Such a hood will likely feature a curved air foil with proprietary air openings that pull inflow air from under the air foil, allowing clean air to continuously flow over it, creating a constant protective barrier from contaminants. The slotted baffle directs inflow air from the hood face to the baffle in non-turbulent laminar streams. A secondary baffle counteracts upward air streams that create airflow "roll" that is experienced in traditional hoods. Also, special provision is made for providing fresh airflow at the researchers face level. (Labconco Corp.)

Another design approach to the laboratory feature is the "Uniflow" design. This fume hood claims advanced performance with reduced air flow. Such hoods are claimed to require no motorized baffles, no costly auxiliary air systems and no special integral supply fans. (HEMCO Corporation, Tel.: 816/796-2900; www.HEMCOcorp.com)

Another laboratory element that is often taken for granted until problems arise is the nature of the laboratory bench top. In well designed, quality labs, elaborate pains were taken to ensure the use of the right material of construction for the tops of the lab benches. All too often, however, substitute materials selected by unknowledgeable contractors were used. To remedy such situations, appropriate fluoropolymer films and sheets designed to protect lab benchtops can be easily and quickly installed.

FluoroGrip fluoropolymer films and sheets have been developed for installation on laboratory benchtops, walls, hoods and equipment to protect against chemicals, spills and everyday exposure. The films offer a simple method for protecting benchtops and provide resistance to a wide range of aggressive chemicals, withstanding the high temperatures found in typical lab environments. Sheets are available in a variety of thickness, widths and lengths, as well as several materials including PTFE or FEP to meet specific lab requirements. Films offer peel-and-stick installation and can be applied over a variety of surfaces. (Integument Technologies, Inc., 70 Pearce Ave., Tonawanda, NY 14150; Tel.: 716/873-1199; Fax: 716/873-1303; Internet: www.integument.com.

Even the ubiquitous and prosaic laboratory balance may need to be reviewed and replaced with a more modern, accurate and efficient unit. A variety of modern analytical balances offer numerous specialized features. Automatic calibration is available on some models, and may be especially useful for work involving standardized testing and compliance requirements.

Balances equipped with USB or RS232 connectors for integrating with various computer set-ups are available. Also, units with special weigh pans which eliminate the effect of air flow results and temperature fluctuations are also available. Real-time temperature compensation software algorithms are available on some units.

Operator convenience is designed into many of the modern models of analytical balances, which not only improve efficiency, but can also be arranged to allow simple, repetitive procedures. This allows the use of less-skilled operators. Especially where repetitive operations are involved, a detailed review and perhaps some more modern equipment can improve the total lab operation.

Innovation, Again

In a previous item in this Department of INJ, a discussion on innovation briefly described some of the scholarly work of Professor Clayton Christensen of the Wharton School of Business at the University of Pennsylvania. This item reviewed some of the findings of Prof. Christensen with regard to "disruptive" innovations in business. This term is used to describe innovations that at first seem to be innocuous, but wind up radically changing an entire culture.

As examples of such disruptive innovations which can blindside well-run companies, Christensen described in his 1997 book, The Innovator's Dilemma, the fate of Digital Equipment, which never saw the PC coming, or why Sears never saw that minor upstart called Wal-Mart.

The book was widely read; for some, it has been very influential and to others in management it is generally very depressing. One US technology leader (Andrew Grove of Intel) has used the book's principles to explain the threat today to the U.S. software industry posed by computer programmers in India.

In the conclusion to this book, Dr. Christensen indicated there is not much that established companies can do to modify their response to such disruptive innovations. Such companies are organized to deal with the existing business and not to radically change because of a slight blip of the horizon due to an insignificant and little-known technology that might become significant in the future. Consequently, the company cannot effectively deal with this situation in the normal course of operations..

The pessimistic message of this book bothered Professor Christensen a lot; he claims he is naturally a rather "optimistic guy." He said that he felt a need to find a cure for the illness he had discovered; he wanted to give managers some hope. To do this, he decided to study the innovators, instead of the victims.

The result is another book: "The Innovator's Solution: Creating and Sustaining Successful Growth," authored with an associate, Dr. Michael Raynor, who was a student of Professor Christensen and is now research director at Deloitte Touche. They have described the book as a "guide to thinking about innovation inside big companies." In fact, their goal is to help organizations find a way to innovate repeatedly, growing at a furious clip, thereby keeping the wannabee disrupters at a distinct disadvantage — always behind!

One principle derived from their study is that a major part of innovation comes from looking at a problem in the right way. As the authors put it — customers don't really buy a product, they hire a product to do something for them. They cite a classic example from a fellow colleague at Harvard: People don't want to buy a quarter-inch drill; they want a quarter-inch hole.

As a resulting principle, the authors state that the key is to innovate around "circumstances," that is, why someone buys something, and not around products or customers. This principle must be kept in mind, especially when initiating a product development project. Focus should be on the "why" of the product more than on the "how". That's not always easy to accomplish. After all, Wal-Mart does has a quarter-inch drill aisle, but no quarter-inch hole aisle!

Christensen and Raynor point out that the very nature of corporate life kills breakthrough innovations. The corporation always focuses on their present product lines and how they can be improved a little. There is little attention given to ways to completely overwhelm the current product line.

Also, the authors are forced to acknowledge that sustained innovation — not incremental innovation, but the big ones that drive real growth — is very difficult, almost impossible to obtain. They admit that there are only a few companies that have done this sporadically over time, but not over a sustained period.

At companies that have sustained innovation for a burst of time, it has almost always been because of the determination, intuition and drive of a single person, the authors write. Sony did it from 1945-80, but it all came forth from the head of co-founder Akio Morita, and fell off after he left. Apple Computer was the most innovative PC company when Steve Jobs was there, faltered after he left, then regained that knack when he came back. It all suggests that rare, spectacularly talented people generally create major innovations. Organizations might never be able to do this. That still sounds a little pessimistic and not much of a "solution."

Of course, that doesn't mean that it's not worth trying. It again highlights the importance of retaining and exploiting the really creative and innovative people. Also, the necessity of fostering and encouraging their work as much as possible, especially when it seems to be "out of the box." ***— INJ***

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PATENT REVIEW

Opening of New USPTO Campus

On December 4, 2003, a Ribbon Cutting event initiated the opening of a new campus for the United States Patent and Trademark Office (USPTO) in Alexandria, Virginia. The new facility, located across the Potomac River from Washington D.C., represents the culmination of a 14-year effort.

A total of five buildings will make up the campus when it is completed and fully occupied. About one-third of the USPTO staff (2600 employees) moved into the facilities that were ready one week following the Ribbon Cutting Celebration.

When completed, the campus will contain approximately two million square feet of office and related space. Completion and occupancy of the remaining buildings will be in late 2004 and early 2005. The whole complex of the five interconnected buildings will house about 7,100 employees. The new campus will house all aspects of the USPTO organization, which has been housed in several locations in Crystal City and elsewhere in Virginia.

The opening and initiating of the new campus is one major step in the 21st Century Strategic Plan that the USPTO announced several months ago. Along with the new physical facility, the automating of the patent and trademark examination process is another major component of the Strategic Plan. As the USPTO moves into the new facility, "most of the paper will be left behind," according to officials. This will improve efficiency and effectiveness while providing substantial savings in space, equipment and file maintenance costs.

Patent examiners in the first technology center to move to the new facility will be processing applications electronically. All newly filed patent applications are converted to electronic applications and then processed electronically. More than a half million pending applications are being scanned into the automated system. To date, over 300,000 applications containing more than 34 million pages have been scanned into the electronic system, making it one of the largest image file databases in the world.

The new headquarters is designed with a heightened and integrated security screening process. Security personnel will monitor the entire campus, including the parking garages, and a security checkpoint in each lobby controls access.

The USPTO Innovation Station Child Development Center will accommodate up to 138 children ranging in age from six weeks to six years when it opens in 2004. This learning-based center will provide employees the opportunity to enroll their children in a state-of-the-art early learning facility right in the midst of the USPTO campus environment. Other amenities for employees as well as the local neighborhood include a museum, cafeteria, and multi-level green spaces on The Dulany Gardens. A multi-purpose auditorium also will be available for both USPTO and community use.

Public amenities include a full-service cafeteria, a landscaped two-acre park located at the center of the campus and a museum. The USPTO expects to complete occupancy of its new headquarters in May 2005.

Progress Made at 21st Annual Patent Trilateral Conference

Over the past 21 years, an annual conference has been held by the world's three major Intellectual Property (IP) centers, the Japan Patent Office (JPO), the European Patent Office (EPO) and the United States Patent and Trademark Office (USPTO).

This year the conference was convened in Tokyo, Japan, with the commissioner of Japan's Patent Office, Mr. Yasua Imai, functioning as host. The European interests were represented by Mr. Ingo Kober, President of EPO, and the US was represented by Under Secretary of Commerce for IP, Mr. James E. Rogan.

A major portion of the meetings were devoted to means and details on reducing duplication of effort and decreasing workload by sharing information and relying on search results obtained from partnerships with other IP offices.

It was agreed that each of the trilateral offices would continue to analyze examination search results previously exchanged between USPTO and JPO and between USPTO and EPO, and to provide feedback to the relevant office. It was also established that within the next year, USPTO, EPO, and JPO examiners would be given electronic access to specific documents and information in the application files of each of the trilateral offices, including the application content, examination search results and priority documents. In the USA, applicant approval will be needed for access by the other two international parties to USPTO's unpublished applications; this is a current requirement of the new procedure at USPTO to publish applications 18 months after they are filed. This procedure puts the USPTO in harmony with the standard procedure of the other two IP offices.

It was also agreed that discussions would continue on harmonizing the interoperability of electronic filing, processing, and access systems of other IP offices, laying further groundwork for a single solution for electronic filing and processing of patent applications worldwide.

All of these objectives are included in the USPTO's 21st Century Strategic Plan, related to reducing duplication of effort and decreasing workload by sharing

Next year's conference is slated to be held at the USPTO's newly open center in Alexandria, Virginia.

United States Joins the Madrid Protocol Covering Trademarks

Some segments of the nonwoven industry consider trademarks to be unimportant. Yes, of course, branded consumer products need such elements and the protection that the law in developed countries provides. For many nonwoven products, however, trademarks aren't considered important.

And yet, a certain brand of fiberglass insulation has trademarked the pink color of their product line. Maybe a little advanced ingenuity could trademark a bonding design or some other unique characteristic of a nonwoven product and achieve a distinct competitive edge. So, trademarks are relevent to nonwovens after all.

Trademarks on the international scene could be even more relevent and important. Consequently, what transpires in the trademark scene is meaningful. Note that the United States completed the formal process for joining the Madrid Protocol on 2 August 2003, when it deposited the accession document, signed by President Bush the previous day, with the World Intellectual Property Organization. The Madrid Protocol is a treaty that facilitates the protection of U.S. trademark rights throughout the world.

As a result, the United States Patent and Trademark Office (USPTO) began accepting so-called Madrid filings on November 2, 2003.

U.S. participation in the Madrid Protocol is another sign of the growing importance that American businesses place on protecting their intellectual property globally," noted Under Secretary of Commerce for Intellectual Property James E. Rogan. "This treaty provides U.S. trademark owners a faster, simpler, less costly means of protecting their marks in any or all of the Protocol's 58 member countries."

Starting in November, a U.S. trademark owner will be able to file a single on-line application with the USPTO in English, pay the fees in U.S. dollars, and potentially obtain protection for its mark in any or all of the 58 Madrid Protocol member countries. Without this treaty, the trademark owner seeking equivalent protection would have to file an individual application in each country, in the language of that country and in the currency of that country.

All applications filed under the Madrid Protocol must be filed electronically. In turn, the USPTO will process the applications electronically. The USPTO's transformation to e-government is a key element of the agency's 21st Century Strategic Plan. Nearly 60 percent of all trademark applications currently are filed electronically. Electronic filing and processing of Madrid applications further the agency's commitment to a fully electronic trademark operation in fiscal year 2004.

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PATENT REVIEW

Method for producing fibers

US 6,652,800 (November 25, 2003); Filed: March 12, 2001. Assignee: Kimberly-Clark Worldwide, Inc. (Neenah, WI). Assignee: Kimberly-Clark Worldwide, Inc. (Neenah, WI). Inventors: Jeffrey E. Fish, Jark C. Lau, Bryan D. Haynes.

This patent discloses a modified melt-blown die for producing microfibers from a molten thermoplastic material, which includes the steps of extruding the molten thermoplastic material from a material outlet having a longitudinal axis and producing a stream of pressurized fluid that exists a fluid tube removably securable to a die head assembly and including an outlet coaxial with the material outlet longitudinal axis and extending at least into the material outlet. The method may be carried out using various material outlet and fluid tube configurations.

Process and device for ultrasound treatment of a strip of material

US 6,652,689 (November 25, 2003); Filed: March 21, 2002. Assignee: Eduard Kusters Maschinenfabrik GmbH (Krefeld, Germany). Inventor: Klaus Kubik.

A process and a device for ultrasound bonding of a nonwoven web. The unbonded web passes through a treatment gap, which is formed by a roller device that includes a rotating roller and a sonotrode that is directed approximately radially against the working surface of the roller body. In order to at least extensively prevent any concentricity defect of the roller body that might result from bending of the roller body, the roller body is cooled directly below the working surface of the roller body. For this purpose, the roller body has a number of lengthwise bores distributed uniformly over the circumference, preferably on an arc, through which a cooling medium flows in essentially uniform manner.

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, films having a microfibrillated surface, and methods of making the same. Microfibers of the invention can be prepared by imparting fluid energy, typically in the form of high-pressure water jets, to a highly oriented, highly crystalline, aliphatic polyester film to liberate microfibers therefrom. Microfibrillated films of the invention find use as tape backings, filters for particulate contaminants, such as face masks and water or air filters, 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 microfibril-

lated articles of the invention may be produced from aliphatic hydroxy acids, making them biodegradable and useful for geotextiles.

Elastically stretchable composite sheet and process for making the same

US 6,649,546 (November 18, 2003); Filed: March 20, 2001. Assignee: Uni-Charm Corporation (Ehime-ken, Japan). Inventor: Hiroyuki Ohata.

An elastically stretchable composite sheet that includes an elastic layer and an inelastic layer formed with stretchable fibers having a relatively small diameter and bonded to at least one surface of the elastic layer. The inelastic layer bonded to the elastic layer is formed from polyolefin thermoplastic synthetic fibers; at least 80% by weight of stretchable fibers includes

thermoplastic synthetic fiber containing a lubricant (fatty acid amide, ester or salt) of 0.1% to about.5.0% by weight. The bond regions are intermittently arranged in the stretch direction; the length of said thermoplastic fibers extending between pairs of adjacent bond regions in the stretch direction is longer than the rectilinear distance between adjacent bond regions.

Structures useful as cleaning sheets

US 6,645,604 (November 11, 2003); Filed: May 20, 1998. Assignee: The Procter & Gamble Company (Cincinnati, OH). Inventors: Saeed Fereshtehkhou, Paul Joseph Russo, Wilbur Cecil Strickland, Jr., Nicola John Policicchio.

The cleaning sheets of the present invention can be made using selected nonwoven processing, including spunbond, meltblown, resin bond, air-through bonding, etc., provided the essential requirement of having at least two regions, where the regions are distinguished by basis weight differences. In particular, the cleaning sheet comprises one or more high basis weight regions having a basis weight of from about 30 to about 120 gsm and one or more low basis weight regions, wherein the low basis weight regions have a basis weight that is not more than about 80% of the basis weight of the high basis weight regions. The preferred structures are nonwoven hydroentangled fabrics. The cleaning sheets may be formed from a single fibrous layer, but preferably are a composite of at least two separate fibrous layers with a reinforcing plastic scrim inserted between the layers. The entire structure can then be bonded by hydroentanglement.

Centralized process for the manufacture of a spunbonded fabric of thermobonded curled bicomponent fibers

US 6,632,313 (October 14, 2003); filed August 3, 2001. Assignee: Corovin GmbH (Peine, Germany). Inventors: Axel Nickel, Stefan Etzold.

A process is disclosed for the manufacture of voluminous spunbond fabrics. The process comprises: (1) spinning bicomponent fibers (side-by-side type, using PP with MFI viscosity of 16 to 35 and second PP with a MFI viscosity range of 8 to25) stretching the filaments and forming the spunbond web; (2) thermobonding the spunbond web; (3) the bicomponent filaments of the web are finally curled by lengthwise and/or transverse stretching while also providing a heat treatment.

Condrapable hydrophobic nonwoven web and method of making same

US 6,632,385 (October 14, 2003); filed: March 23, 2001. Assignee: First Quality Nonwovens, Inc. (State College, PA). Inventors: Michael Kauschke, Mordechai Turi, Horst Ring, Sabine Borst.

"Condrapability" designates a fabric attribute combining the aesthetic tactile parameters of hand and drapability. Conveniently, hand may be thought of as related to the external or surface friction of a fabric, and drapability may be thought of as related to the internal or fiber-to-fiber friction of the fabric.

A condrapable, hydrophobic spunbond nonwoven web comprises a hydrophobic nonwoven web of continuous filaments, and a fiber surface-modifying agent on the web to form therewith a condrapable hydrophobic web. Such a web does not loose hydrophobicity because of the presence of dispersing or other processing agents. The fiber surface modifying agent is essentially an amino-modified polydimethylsiloxane.

The condrapable hydrophobic web is characterized by a substantial hydrophobicity, as measured by a strike-through of over 180 seconds and by a substantial increase in condrapability, as measured by a Handle-O-Meter decrease of at least 15% average for MD and CD.

Method for producing materials having z-direction fibers and folds

US 6,635,136 (October 21, 2003); filed April 24, 2001. Assignee: Kimberly-Clark Worldwide, Inc. (Neenah, WI). Inventors: Edward Jason White, Kurtis Lee Brown, John Herbert Conrad, Robert James Gerndt, Jose Enrique Maldonado.

This patent discloses a method for producing in a spunbond web z-direction ridges or folds in the web. This is achieved by conveying the layer of continuous fibers onto a forming belt moving into a nip formed by the moving forming surface and a second moving upper surface which is traveling at a slower speed than the first moving surface. This results in formation of a plurality of z-direction loops in the fibers giving loft to the fabric on both fabric surfaces. Controlled vacuum and positive air pressure at the appropriate points is used to transfer the web from the first moving surface to the second moving surface.

Fabrics formed of hollow filaments and fibers and methods of making the same

U.S. 6,620,746 (September 16, 2003); filed: November 19, 1999. Assignee: BBA Nonwovens Sweden AB (Sweden). Inventors: Bengt Jennergren, Peter Nikko, Urban Lindberg, Hakan Holmer..

This invention relates to nonwoven fabrics formed of hollow filaments and/or hollow fibers, useful for hygiene, medical, and industrial applications. The fabrics disclosed include spunbond fabrics comprised of continu-

ous hollow filaments, as well as nonwoven fabrics produced from hollow staple fibers. Also disclosed are multi-layer composites produced from such nonwoven fabrics with meltblown layers, such as typical of SMS composites. The hollow spunbond filaments and hollow staple fibers can impart several advantageous properties to the fabrics, including a way to allow the fabric manufacturer to increase the number of filaments and/or fibers in a fabric for a given basis weight, or conversely, to lower the basis weight of a fabric without lowering the number of filaments and/or fibers. This can improve the barrier properties of the fabrics without unduly increasing basis weight. This can also improve resistance to bleed through of adhesives and improved SAP containment and strikethrough/rewet for hygiene applications, due to the increased number of filaments and/or fibers for a given basis weight. Hollow filament spunbond fabrics and hollow staple fiber nonwoven fabrics can be effectively utilized as the outer layers of typical SM and SMS fabrics, utilizing conventional meltblown webs for the inner ply.

Method of increasing the meltblown jet thermal core length via hot air entrainment

U.S. 6,613,268 (September 2, 2003); filed: December 21, 2000. Assignee: Kimberly-Clark Worldwide, Inc. (Neenah, WI). Inventors: Bryan David Haynes, Jeffrey Lawrence McManus. Justin Max Duellman, Darryl Franklin Clark, Roger Bradshaw Quincy, III.

A method for producing super fine meltblown fibers involves increasing the length of the meltblown jet thermal core to increase the dwell time of the extruded thermoplastic polymer within the jet thermal core. Through use of the method it is practical to use low viscosity resins and further to provide meltblown nonwovens with superior barrier properties to the passage of fluids and particularly gases. The method further provides a useful means for blooming internal additives to the surface of the fibers.

Disposable wiping article with enhanced texture and method for manufacture

U.S. 6,623,834 (September 23, 2003); filed: January 14, 1999. Assignee: The Procter & Gamble Company (Cincinnati, OH). Inventors: Nicholas James Nissing, David William Cabell.

A single- or multi-ply disposable wiping article is disclosed. The disposable wiping article comprises one web layer with a surface topography exhibiting regions of minimum and maximum calipers. A creped paper (preferably with apertures) which has wet extensibility is preferred for the first layer. A second layer, consisting of a nonwoven web (preferably a spunlace fabric) is bonded to the first layer. A continuous polymer network defining bonded regions and a plurality of unbonded regions is bonded to the web or composite. The continuous polymer network is preferably a thermoplastic adhesive applied in a continuous network pattern. After curing, the thermoplastic adhesive can contract upon heating, thereby creating puckered regions of maximum caliper coincident unbonded regions. The minimum caliper of the web layer is coincident the bonded regions. ***— INJ***

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TECHNOLOGY WATCH

The Changing Geography of Synthetic Fibers

About 28 years ago, a small news item appeared in the fibers industry press. This news note indicated that a shift had occurred within the fibers industry, wherein Great Britain was no longer the worlds' largest producer of synthetic fibers. The lead had been taken by a growing industry located on a small island off the China coast — Taiwan, to be specific.

The news item was probably noticed by few people, even within the fibers industry. After all, the British Isles still was home for a very large and multiple-unit enterprise consisting of fibers, fabrics and converted products made not of only synthetic fibers, but natural fibers as well. Also, the major production capacity of all types of fibers was still within the bounds of a small number of select western countries.

Only a few industry observers recognized that a seminal event had occurred. Not only the event, but also the inexorable trend involving the geographic shift of fiber production to Asia. This was not easy to properly assess at an early point nor to extrapolate to the logical situation that would exist a few years hence.

Using the easy and not very brilliant method of a retrospective look, it should be obvious that the rather explosive growth in sales in the last quarter of the 20th century of fiber producing equipment, fiber process lines and related facilities into the developing countries of Southeast Asia, would some day result in a significant geographic shift.

That day has now arrived, as production data and short-range forecasts clearly indicate the region of Southeast Asia has become the nexus of synthetic fiber production in the world. This region includes Taiwan, and also, India, China, Malaysia, Indonesia and adjoining areas.

This shift could have been predicted, not only from the sale and installation of processing equipment, but perhaps also from the places of the origin of students filling the Textile Departments of the numerous major universities throughout the world during the last quarter of a century . While many of these students found jobs and careers in Western nations, many others naturally sought and built opportunities in their native homelands.

A quick review of the events of this trend can be very revealing. In the United States, fibers were a net export industry until the early 1990s. The U.S. fiber industry had some good markets overseas. During the decade of the 90s, however, very large amounts of fibers, as well as fabrics and garments from Asia, began to land in the U.S. This surge was driven by a combination of national subsidy and investment policies in Asia and the U.S., by the weakening of Asian currencies to lower the price of the imported products, and by a national fiscal policy to export Southeast Asia out of their economic doldrums.

South Korea, Hong Kong and Taiwan, particularly, aggressively moved into many of these markets, but these countries proved merely to be the harbingers of a larger flood — the arrival of China in the man-made fiber field.

China, blessed with a population of about 1.3 billion people, and unencumbered by a market economy that would tend to exercise investment controls in low-margin businesses, arrived with a flourish. Total Asian man-made fiber production grew from 45% of world production in 1990 to 72% in 2002. Simultaneously, China's share of this Asian production grew from 20% in 1990 to more than 44% by 2002. Not surprisingly, China achieved its dominance with a 72% operating rate as late as 2002.

In the early- to mid-1990s, Asian economies suffered in the shadow of Japan's banking crisis as they anticipated their own similar fates, which were partially realized in the late 1990s, with the tremendous Asian currency devaluation crisis. Early in the decade, Asian money flowed into the United States intent on investing in man-made fiber production. In the U.S., state governments and localities stumbled all over one another to host the new multibillion-pound facilities so easily promising jobs and economic stimulation for the participants.

Soon the Asian currency crisis caught up with Asian manufacturing in the United States, and the direction of the Asian businessmen changed to investment at home. After years of dependency on international fiber sources, Asian fabric and garment manufacturers discovered that all of the added value associated with garment manufacturing and exporting could remain in the host country if that nation produced fibers and fabrics, in addition to garments. All of this gave momentum to the shift of fibers, fabrics and apparel to Southeast Asia in particular.

It isn't too difficult to detect a similar situation with regard to the nonwovens industry, its customers and related industries. The location of many nonwoven lines installed in Southeast Asia and elsewhere throughout the world in the last few years presages a similar shift for nonwoven production to areas outside of the developed countries; obviously, the production of converted nonwovens into consumer, medical, industrial and other products has and will likely continue to follow. A rather cursory study of recent international nonwoven exhibitions clearly show that this trend is real and has considerable momentum.

It is also noteworthy that the production facilities going into these new loca-

tions are not the older, out-dated technologies, but rather the investments are into the latest and most advanced process lines and equipment. This certainly suggests some aspects of the nature of industry-wide competition to be experienced in the coming years.

It may also be noteworthy, that many of these new installations are backed up by only a small technical effort, not nearly as comprehensive and extensive as the research and development effort that fueled the growth of the industry in the middle and later part of the last century. This rather limited injection of R&D into these relatively new installations may make the forecasting of new and innovative nonwoven development rather difficult and problematic over the next couple of decades.

Cellulose Nanofiber Production Via Electro-spinning

The electro-spinning process for producing fine thermoplastic fibers was originally researched by a group at Battelle-Geneva in the decade of the 1970s.

This process involves molten resin on an electrode facing a similar, collecting electrode with the opposite electrical charge. When an electric current is given to the pair of electrodes, a very fine flow of the resin melt streams from the supply electrode to the collecting electrode. The thread of resin solidifies giving an extremely fine fibrous web on the collecting electrode.

Several European nonwoven and fiber companies provided financial support for this research project at the time. The Dexter Company finally licensed the process and pursued a product development effort, primarily aimed at filtration applications.

This effort eventually led to the construction of a semi-works line at Dexter's plant in Scotland. The line coated a nonwoven substrate with a web of microdenier fibers, with a polyamide resin being the prime raw material.

Reportedly, this line was abandoned after considerable development effort, primarily because of the propensity for the forming fibers to overheat and burst into flame. Fires on the semi-works line were apparently fairly common.

The major elements of the electro-spinning process have been employed in a variety of attempts to further develop and perfect this technology. A recent report indicates that a polymer solution variation of this process is being researched at Cornell University. In this iteration, a new class of solvents for cellulose has been developed and employed by the Cornell researchers Margaret Frey, Yong Joo and Choo-won Kim.

Cellulose in dissolved in the solvent system before the liquid polymer solution is forced through a small pinhole, where a high voltage is present. The electric charge then draws the polymer solution through into a micro-fiber, which is gathered on an electrical ground. The polymer solutions suitable for the electro-spinning in this system must be capable of carrying electrical charges. The result, according to Dr. Frey, is that the electrical, rather than mechanical, forces produce a tiny fiber that is "less than 100 nm in diameter, which is 1,000 smaller than in conventional spinning."

The fine, cellulose fibers are collected an a "nanofiber mat" according to the Cornell researchers. The focus of their program is the potential use of waste cellulose as a polymer raw material. Such waste, of course, exists in the U.S. to an extent of millions of pounds per year, consisting of processing wastes as well as used cotton from discarded fabric and other products.

The Cornell team foresees the process to be an important factor in resources recycling, as they envision uses for the product in filtration, agriculture, environmental clean-up and numerous other applications. Further information is offered on their web site: www.cornell.edu . — *INJ*

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NONWOVEN NET

Making Your Computer More Charitable

Back in the early days of computing technology, when IBM punch cards were the hallmark of computing science, some public service activities were carried out by those who had the big mainframes. Some of these organizations – universities, government locations, big corporations, etc. – would have a little "free time" on their machines, which they would offer to the little people that were enthralled with this emerging wonder.

This arrangement allowed many a small computer club, Junior college and others to "run" their efforts on this equipment when it would otherwise be idle. By so doing, the excitement and knowledge was spread and the interest in computing was greatly advanced.

Today, such a mentoring activity is unnecessary, as the average laptop computer has more computing power than a room-sized unit had in the early days. However, the opportunity to use free time on the average person's computer for "charitable purposes" still exist, and may be increasing.

It may seem unlikely at first glance that "spare" time on your personal computer can benefit others, but many such opportunities exist. This concept is generally referred to as "distributed computing". It works like this. While supercomputers in various locations are hard at work trying to solve some of the world's issues, the total computing capacity of all the PCs that are not in use at the moment, is tremendous. If such computing capacity is harnessed, it would substantially augment the work of the relatively few supercomputers. The more computing power brought to bear on a problem, the faster it can be solved. Hence, the interest in "distributed computing".

When the power of the lowly Pentium is magnified by a sufficiently large number, it easily exceeds that of a large supercomputer. Methods have been devised to distribute some of these "big" problems to PCs all over the world and to use their spare power to assist in solving these big problems.

And the problems involved can be big and also important. Typical projects involve searching for the building blocks of cancer, or a cure for smallpox, or working on complex mathematical problems, or analyzing demographic data for smaller countries. A recently completed project was to determine the largest known prime number. Just think "complex" and you can image some of the uses for distributed computing.

One popular site is United Devices. To become involved, you log onto www.grid.org and download a small application program. This program "borrows" some of your disc space and CPU time; it then puts it to work when you are not using it. You will never notice the CPU time the application needs. However, if this bothers you a little, it is possible to enter "Preferences" and then tell the program to run only when your screen saver is on.

Many computer users keep their unit on all the time, and so this is a great way to make your computer more "charitable." You can turn the monitor off in order to save energy. The application goes online only when it needs to download a new parcel of data to work on. It goes to work computing in the background and unloads the data when it needs to. For dial-up connections to the Internet, all of this can occur only when you go online.

A similar project is devoted to examining radio signals from outer space to help find intelligent life. It is called "SETI at Home," and is coordinated by the Search of Extraterrestrial Intelligence (SETI). The application for this project can be most easily obtained by going to www.google.com and entering in "SETI at Home" to find the link.

There are many other projects for charitable computing, most easily found on the internet, by using the term "Distributed Computing Projects". There are some such projects that are distinctly charitable, such as The Hunger Site (www.hungersite.com) and others.

Who said "Computers are only evil" anyway?

Q&A Site on Food Safety

An Iowa State University project team has come up with a science-based question-and-answer web site that provides answers to consumers' food-safety questions.

By logging in on this site, Ask a Food Safety Expert (www.foodsafetyanswers.org), a person can search a fairly broad database for answers to the most commonly asked food-safety questions. If the desired answer is not in the site's database, the enquirer has the option to ask a food-safety expert, from a team of university and other experts recruited to provide individual answers for consumers or for food service personnel..

Iowa State University officials say the site is designed for easy use by consumers and food-industry employees. They indicate that the project has greatly promoted information-sharing among food safety experts and educators.

The site is funded by the United States Department of Agriculture and supported by several federal and state agencies.

The question naturally arises — What about a Q&S site for nonwoven science and technology. Perhaps a site where someone in a completely different field from nonwovens could get a quick answer and a running start on finding a nonwoven that fits a need in another discipline.

Any ideas?

Getting Help from a Gloss

To the nonwovens scientist or product development expert, the word 'gloss' is associated with the shine or luster of a surface. More technically, it is related to the specular reflectance of light from such a surface.

However, there is another completely different meaning to the word 'gloss', and there may be some value to the researcher in this other usage. "Gloss" can also refer to a note that explains or translates a difficult expression, a commentary that accompanies a text, or a list that itemizes a term and its meaning. Such a listing is referred to as a 'glossary'. Now that makes the word 'gloss' more understandable.

There is also a verb, 'to gloss', which means to construct a glossary. Another meaning of the same word is apparent in the expression 'to gloss over', but that is getting away from the objective of this discussion.

Nonwoven researchers are very good at creating new terms and abbreviations for new terms. Some of these represent a shortening of a phrase that may be long and frequently referred to. Everyone now knows what SMS stands for, along with ALP, ADL, ANW. However, a problem often arises when a person refers back to notes made sometime ago which are filled with such shorhand abbreviations. What does that term mean?

Of course, SMS stands for Spunbond/Meltblown/Spunbond composite, while ALP is Air Laid Pulp, and ADL is Acquisition-Distribution Layer, and ANW is Apertured Nonwoven! (At least it is for me.)

The problem becomes much more difficult when dealing with cross-disciplinary words, terms and abbreviations. That's when a person really needs a glossary.

In the past some help in deciphering an obscure industry term could be obtained from a specialized printed thesaurus, or obtain help from a value-added online service, such as the National Library of Medicine's Medical Subject Headings (MeSH), or INSPEC's thesaurus of sci-tech terms. They can be useful, but generally are not free, and of course if the term is relatively new, it was generally not included in the collection. In such cases, you were out of luck!

Now, of course, there are web dictionaries, glossaries and thesauri on just about any topic you can imagine. For an explanation of investment and financial terms, consider the Investopedia

dictionary of investment terms, at http://www.investopedia.com/dictionary . For terms about the environment and biodiversity, try the World Resources Institute's biodiversity glossary, at http://www.wri.org/wri/biodiv/gbs-glos.html . Medical Subject Headings can be found at http://www.nlm.nih.gov/mesh/MBrowser.html .

How about a glossary of glossaries?

Fortunately, there are ways to find such glossaries. One great source is "The Glossarist" (http://www.glossarist.com). This is a directory of web-based glossaries and subject-specific dictionaries. It is managed by an Australian who called himself 'The Website Glossarist (websiteglossarist.com), otherwise known as Woz (Postal Address PO Box 395, Rozelle NSW 2039 Australia; Phone 61+ 416/ 256 888; Fax 61+ 2 9/546 2788.

Amongst the subjects covered in this glossary are the following:

Arts & Culture
Business Careers & Employment
Computers & Internet
Economy & Finance
Education
Entertainment
Family & Relationships
Government, Politics & Military
Health, Medicine & Fitness
Humanities & Social Science
Law and Justice
Lifestyle
Media
News & Weather
Reference
Science
Sports & Recreation
Technology
Transport
World, Regions, Countries & Travel

Some other approaches can also be useful. Google has developed a glossary search that goes beyond its spell-check function. Although single words can be searched by using the syntax define:searchterm (try define:erlang to learn about an obscure telecom term), phrase searches do not work consistently.

For multiple-word definitions, go to the test version of Google Glossaries, at http://labs.google.com/glossary and type your phrase in the search box. In either case, Google will return definitions of the word or phrase from web-based glossaries and thesauri. And remember to click through from the definitions that Google provides on the search results page to the originating web site, which will be a dictionary or glossary of other terms within that topic or industry.

You can also find high-quality glossaries and subject-specific dictionaries by going to a web directory such as the Open Directory Project (http://dmoz.org) or the Librarians' Index to the Internet (http://www.lii.org), selecting the subject category you are interested in, and then clicking through to a subcategory with the word "glossaries," "terminology" or "dictionaries."

A very useful glossary on terms involved in ISO 14001 and environmental standards that can cut through the new technical terms and give you really useful terms can be found at http://www.bsiamericas.com/ohsen .

Good Glossing! — *INJ*

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ASSOCIATION BULLETIN BOARD

2004 Visionary Awards at Vision 2004

Although the annual INDA conference entitled VISION is relatively new, it has already established a loyal following and generates a lot of interest. This conference focuses on the numerous business, science and technology aspects of the diverse nonwoven-based consumer products industries, an important and growing segment of the nonwovens industry.

An anxiously awaited element of VISION 2004 is the announcement and presentation of the 2004 VISIONARY AWARD, for the most unique and innovative nonwoven-based product recently introduced to the market. In view of the significant number of such product introductions each year, this competition generates a great deal of interest. The nominated entries often presage an exciting and growing segment of the industry, a segment that will garner a lot of attention in the coming months.

The finalists for the 2004 VISIONARY AWARD are the following products and their producers:

- BRILLO Scrub 'n 'Toss cleaning product - Church & Dwight
- Easy-O-Fit face masks - Golden Phoenix (Taiwan)
- HUGGIES Convertibles Diaper-Pants - Kimberly-Clark Corporation
- SWIFFER Dusters - Uni-Charm Corporation/The Procter & Gamble Company
- THERMACARE Heat Wraps - The Procter & Gamble Company

Attendees at VISION 2004, being held January 25-28, 2004 in Las Vegas, NV, will be given the opportunity to express their judgement in rating these new products. The results of the voting will be announced at the VISION 2004 Conference, and The 2004 VISIONARY AWARD will be presented to the lucky and deserving recipient.

AUTEX 2004

The Association of Universities For Textiles (AUTEX) is an international organization linking universities with significant departments devoted to textiles, fibers and related subjects. For the past four years AUTEX has been sponsoring an international conference for its member organizations as well as other organizations and entities with like interests.

The 4th annual AUTEX conference, AUTEX 2004 has been announced and the organization of the conference is going forward.

Current plans are that AUTEX 2004 will be held next year on June 22-24, 2004. The venue for the conference is Roubaix, France. Although a wide selection of papers on textiles, fibers and related subjects are being invited, the major topics for this conference will be the following

Advancement in Textile Processes.
Biotechnology and Textiles.
Benchmarking and Re-engineering
Color Science in Textile
Comfort Factors in Textiles
Fiber and Fabric Mechanics
Functional Textiles
High Performance Fibers
Logistics Innovation
Nonwovens
Optimization and Forecasting
Personal Protection
Safety & Environmental Factors in Textiles
Simulation and Modelling Textiles
Surface Treatment of Fibers & Fabrics
Technical Textiles
Textile Processing andFinishing
Textile Supply ChainManagement
Textile Trading and e-Commerce

Further details on AUTEX 2004 are available from: General Secretary AUTEX, Ms. Dhouha Saihi, Tel.: 33+3/2025-7575; Fax: 33+3/2027-2597; Internet: http://autex2004.ensait.fr/ .

Filtration Was The Topic

Crowded aisles, overflowing seminar rooms and busy exhibits marked the three days of the successful Filtration 2003 International Conference and Exposition, held November 8-20 in Chicago, Illinois.

A total of 110 exhibitors from around the world of filtration set up shop in the Navy Pier Exhibition Hall for the two days of the Exposition. INDA, Association of the Nonwoven Fabrics Industry, organizer of the annual event reported that attendance figures beat expectations and that initial exhibitor and attendee responses were overwhelmingly positive.

"Filtration 2003 once again attracted visitors from all corners of the world, anywhere that the business of filtration is paying an increasingly important role in our everyday business and personal lives," said INDA President Rory Holmes. "This event once again lived up to its claim as the largest filtration event of the year."

Exhibitors and attendees alike praised the global nature of Filtration 2003, as well as the availability for the first time of the latest new filter media, raw materials and equipment that were on display. The event also provided a unique opportunity for some of the world's experts in filtration to exchanges news and views. Because of the major role that filtration of all types is playing in the lives of everyone, This technology is receiving substantial effort on many fronts. For the nonwovens industry, it has proved to be one of the more profitable and fast growing business segments.

The currently emerging recognition of the importance and the potential critical impact of particles less than 2.0 microns on human health, both indoors and outdoors, has stimulated a flurry of activities in this sector of filtration technolo-

gy. It has also greatly enervated R&D on microdenier fibers, as such materials appear to be key elements in successfully meeting the current challenges.

These fine particles, no matter what the source, can easily be transpired into the depths of the lungs and pulmonary systems of humans and animals alike. Removal of the particles from these deep locations is very problematic; residing in such locations, they can be the foci of a myriad of discomforts and major medical problems.

Based on recent news accounts of the problems with human blood utilized in transfusions — problems of blood quality and suitability — even the average person is beginning to appreciate the desirability for contamination control possible via proper filtration technology. The number of patents and the increased offerings of nonwoven-based leucocyte-depletion filters signals a growing awareness of the importance of proper filtration.

Not only in the area of living creatures is filtration becoming more important, but also in the arena of inanimate machinery, instruments and systems is the filtration of liquids and gaseous materials increasing in importance every day. Warfare and life in desert conditions has recently highlighted some of these critical needs.

The greater complexity and precision of an increasing array of systems that surround us every day point to increasing needs for superior filtration methods. Some of this mounting awareness was reflected in comments made at Filtration 2003.

The keynote presentation given by Dr. William J. Rea, of the Environmental Health Center in Texas reflected this growing concern and awareness. Dr. Rea issued a challenge to the global filtration industry to develop even better technology to improve indoor air quality in his presentation, "The Impact of IAQ on Human Health." Dr. Rea praised the filtration industry for playing a vital role in the battle for improved IAQ. But, at the same time, he challenged filter manufacturers and suppliers to "engineer better systems so people don't get sick when they breathe the air."

Scott Ciampa, General Manager of exhibitor Sheepscot Machine Works, Newcastle, ME, said that "the face-to-face meetings we have had here are important to us and with a lot of the filtration business staying, we get to see most of our customers here. Plus, we have spoken with people from the U.K., Italy, Russia, Turkey, India, Taiwan and Australia who are interested in our products."

Attendee Angel Perez, Operations Manager for Edwards Refrigeration, A/C and Electrical Services, Caguas, Puerto Rico, said "We came here to learn more about filtration in both the seminars and at the trade show. We are meeting with representative of filtration companies to see if we can bring some of their products to Puerto Rico. There is quite a list of exhibitors here and we expect to be able to do some business."

One of the highlights of each Filtration Exposition is the naming of the best booths in three different categories: Best Large Booth (over 200 sq. feet), Best Small Booth and Best First-time Exhibitor. The recipients at Filtration 2003 for these awards were:

- Best Large Booth:

First Place-BBA Fiberweb Filtration.
Second Place-Johns Manville

- Best Small Booth:

First Place-Lauscha Fiber
Second Place-DelStar Technologies

- Best First-time Exhibitor

Rogers Foam

In top photo, INDA president Rory Holmes (second from left) and Best Booths judge Ron Cox of Kimberly-Clark (far right) present the award for second place Best Small Booth to DelStar Technologies during Filtration 2003 in Chicago in November. In photo below, Holmes presents BBA with its second consecutive Best Large Booth Award.

Plans for Filtration 2004 are already underway, with the dates of 7-9 December 2004, and the venue at Pennsylvania Convention Center, Philadelphia, PA — ***INJ***

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NONWOVENS CALENDAR 2004

January 2004

Jan. 13-14, 2004. ASTM Eighth Symposium on Performance of Protective Clothing: Global Needs and Emerging Markets. Tampa, Florida, USA. Sponsored by ASTM Committee F23 on Protective Clothing. For more information, contact: Dorothy Fitzpatrick, Symposia Operations, ASTM International, W. Conshohocken, PA. Tel.: 610/832-9677; Web site: www.astm.org .

Jan. 13-15, 2004. Conference of The American Filtration Society. Southwest Research Institute, San Antonio, Texas. For more information, contact the American Filtration and Separations Society, Department of Chemical Engineering, University of Houston, 4800 Calhoun Road, Houston, TX 77204-4004; Internet: www.afs@afssociety.org . Tel. 713/ 743-3671; Fax: 713/743-3679

Jan. 25-28, 2004. Vision 2004 Conference. Mandalay Bay Hotel, Las Vegas, NV. Consumer Products conference, focusing on absorbent products, personal care and household cleaning. For more information, contact: INDA, P.O. Box 1288, Cary, NC; Tel.: 919/233-1210; Fax: 919/233-1282; Internet: www.inda.org/events/vision04/vision04conference.pdf .

February 2004

Feb. 15-17, 2004. INDA Annual Meeting. Don CeSar Beach Resort & Spa. St. Pete Beach, Florida. For more information, contact: INDA, P.O. Box 1288, Cary, NC; Tel.: 919/233-1210; Fax: 919/233-1282; Internet: www.inda.org/events/index.html .

Feb. 17-19, 2004. INDA Nonwovens Training Course. INDA Headquarters, Cary, NC, 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.

Feb. 18-19, 2004. Innovations in Medical, Protective, and Technical Textiles. Embassy Suites, Cary, NC. This conference, sponsored by AATCC, will feature sessions on innovative fiber technology, antimicrobials, UV protection, flame retardants, medical textiles, protection and comfort. For more information, contact: AATCC, Research Triangle Park, NC; Tel.: 919/549-3531; Fax: 919/549-8933; Internet: www.aatcc.org .

March 2004

Mar. 1-4, 2004. EURO-GEO 3. Munich, Germany. International conference on geotextiles under the auspices of the International Geosynthetics Society. For more information, contact: EuroGeo3 Technische Universität München, Baumbachstrasse 7, Munich, Germany 81245; Tel.: 49+89/289-27139; Fax: 49+89/289-27189; Web site: www.gb.bv.tum.de/eurogeo3/eurogeo3.htm .

Mar. 9-11, 2004. Nonwoven Technology Conference 2004. Hilton Sorrento Palace, Sorrento, Italy. 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 .

30 Mar.-2 April, 2004. 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 .

April 2004

April 19-23, 2004. 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.afs-society.org .

April 27-29, 2004. 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 .

May 2004

May 18-20, 2004. 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.

May 23-27, 2004. 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 . Internet: http://www.dhu.edu.cn/83tiwc.htm .

May 26-28, 2004. Fiber Society 2004 Spring Symposium. Clayton (St. Louis), MO, USA. The Symposium them is "Fibers, Fibrous Structures and Filtration". For more information,

NONWOVENS CALENDAR

Contact Dr. K. J. Choi (kchoi@aafintl.com) or Professor Daren Chen (chen@me.wustl.edu). Internet: www.thefibersociety.org .

June 2004

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

August 2004

Aug. 10-12, 2004. 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.

October 2004

Oct. 10-14, 2004. 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.marketingtechnology-service.com .

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

Oct. 27-29, 2004. 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. Internet: www.ifaiexpo.info

November 2004

Nov. 16-18, 2004. 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.

Nov. 18-20, 2004. 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. 7-9, 2004. 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 . ***— INJ***

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