

Innovations in nonwovens presented at March conference

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Efforts to reduce formaldehyde use, new developments in filtration media, tips for achieving ISO 9000 certification, and product disposability were among the range of topics discussed at TAPPI's 1995 Nonwovens Conference, held March 3–8 at the Hilton Hotel in St. Petersburg, FL. The Conference and Trade Fair drew more than 300 people and was co-sponsored by the American Filtration and Separations Society.

On two evenings a Reception and Trade Fair was held for attendees to receive up-to-date knowledge of materials, processes, products, and services available to those in the nonwovens industry. In addition, it afforded the opportunity to meet clients, network, or socialize with old and new friends and associates.

The Technical Sessions had a full complement of papers presented in 12 different sessions. The Building and Industrial Mat Committee had four papers presented. Greater acceptance and usage of geotextiles has lead to a 400-million yd^2/year market. Of this 70% are nonwovens, 27% woven, and 3% made by other means.

Another paper described the importance of the conveying belts for glass mat. Metallic belts are used to withstand the high heat involved during drying. More than half of the belts do not operate in alignment. This causes poor tracking and reduced belt life. One of the problems associated with mat production is slime. Slime can produce holes and odors which cause downtime and reduce the quality of the mat. Still another paper stressed the advantage of physical modeling of a through-air mat oven. Such experimentation was shown to prove the cause and cure for wrinkling and cross-machine cure problems.

The Filtration Media Session had four papers. One described a two-component nonwoven fibrous filter model. The pressure drop for a wide variety of staggered array arrangements of fibers was calculated. In another paper the probability of a particle passing through air filter media is mainly a function of particle size. However, particle material, shape, and density; air flow velocity; filter media characteristics; and electrostatic charge are also influence filter effectiveness. One paper illustrated both theoretical and experimental results for determining pore size distribution, mean flow pore, and permeability of various types of filter media. The

Technical Program Chairman T.M. Singh, Conference Chairman Norman Scheffel, and *Tappi Journal* Technical Editor J. Robert Wagner



last paper in this session described the use of three antimicrobial compounds for preventing bacterial growth on melt-blown filters.

There were two sessions on fibers. The first had four papers and the latter five papers. The first paper described the use of cross-linking technology to develop fibers having greater ability to open up the pulp furnish, increase the speed of drainage, and give higher bulk and higher porosity. The process, advantages, and uses of bleached cotton for nonwovens were also described. Air doffing of bleached cotton enabled improved opening, with dramatic reduction in trash content. Blends of cotton and cellulose acetate were shown to produce nonwovens that were compostable and biodegradable. The benefits of cold plasma surface modification of polymers was described. Also discussed was the use of image analysis to measure length, thickness, curl, and orientation of fiber segments.

A rather interesting paper was given on a new deep-grooved polyester fiber which gives improved fiber surface area and bulk with exceptional fluid transport capabilities. Such a fiber should be very useful in filtration, absorption, and insulation applications. Another paper discussed the concerns of producing wet-laid nonwovens using long fibers with aspect

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ratios >300:1. Another paper showed that a blend of cellulose, glass, synthetic staple, and binder fibers could make an effective wet-laid filter to separate serum from whole blood.

A Formaldehyde Test Methods Panel initiated by the Binders and Additives Committee had the objective to form agreement on a suitable industry formaldehyde measurement standard for binders, stack emissions, and nonwoven products.

Session five consisted of a Suppliers Showcase that discussed binders and modifiers for fiberglass, advances in cemented tungsten carbide, roofing, thermal spray coatings, and continuous web inspection.

Two sessions covered ISO 9000 certification and product quality. A range of papers described the advantages of obtaining ISO 9000, 9002, and 9003 registration; how it is obtained; employee acceptance; importance of management support; consultants; and dollar savings in improved quality.

The session on disposability of nonwovens had one paper on life-cycle assessment which provided an update on evaluating the environmental attributes associated with a product. One paper reported on the use of low-molecular-weight polycaprolactone as a plasticizer for cellulose acetate to assist in biodegradation. Legislative, economic, and customer pressures have led to greater interests in environmentally friendly binders. Several papers described guidelines for successful recycling programs or methods to transform waste textile materials into useful products such solid panels to reduce landfill usage by improved creativity.

A panel discussion concluded that fiberglass poses little, if any, risk to the public health under normal conditions of use.

In another session, a model was described for predicting fiber diameter, stress along the threadline, and the amplitude of fiber vibration when producing melt-blown nonwovens. The use of melt-blown electrets indicated that filtration efficiency can be greatly improved by electrostatically charging the filter media. Copolyester elastomers can be ideal for medical applications as they do not contain plasticizers and can be extruded into film less than 0.001 in. in thickness. Lightweight barrier film and high-strength nonwoven composites were shown to provide strong, durable chemical barriers for protective clothing. Microporous, ultrafilter, and reverse osmosis membranes used for filtration and separation applications were also described.

The Binders and Additives Committee scheduled four technical papers relating to formaldehyde or methods that eliminate its use in production. The first paper dealt with a formaldehyde-free acrylic cross-linking binder for nonwovens which exhibited outstanding properties. The second paper discussed a new test method that permitted the detection of minute levels of formaldehyde. Another paper showed the relationship of catalysts and temperature to the properties of resins as dependant on the final ratio of formaldehyde to urea or phenol and binder components. The last paper dealt with an analytical method of measuring formaldehyde during the drying and curing of latex binders.

Awards

Michael A. Madden, Nonwovens Division Chairman, gave the opening remarks at the Opening Session and Awards Ceremony. TAPPI President Jack E. Chinn was on hand to present the awards. Albin F. Turback was presented the Leadership and Service Award and a US\$ 500 honorarium. Wendell L. Anderson received the Nonwovens Division Technical Award and Mark Hollingsworth Prize of US\$ 1000. The Outgoing Division Chairman Plaque was presented to Michael A. Madden. Outgoing Committee Chairmen Certificates of Appreciation were presented to Mick G. Stratton, Maureen Dever, and Hyun S. Lim. T.M. Singh received a Certificate of Appreciation for serving as the 1994–1995 Conference Technical Program Chairman.

The 1994 Conference Best Paper was awarded to Maureen Dever and her co-authors Wayne T. Davis and Catherine Cornell for the paper "Comparison of experimental and theoretical efficiencies of residential air filters." This was also the Filtration Media Session Best Session Paper. Best Session Papers Awards were also presented to the following: Binders and Additives—"Novel polymer systems" by Robert C. Marriott; Building and Industrial Mat—"Heat transfer dynamics" by Thomas M. Smith; Fibers—"Paper machine evaluation by fiber orientation profile analysis" by Irwin M. Hutten; Process Technology I—"Comparison of layered and homogeneously blended cotton and thermally bonding bicomponent fiber" by Kermit E. Duckett, Larry C. Wadsworth, and Vikram Sharma; Process Technology II—"Polypropylene extrusion systems for nonwovens processes" by Chia Y. Cheng; and Product and Quality Assurance—"Changes in dimensions of web during fluid uptake and its impact on absorbency" by Bhupender S. Gupta and Cheol-Jae Hong.

One of the important aspects of the conference is the committee meetings. During these meetings progress reports are read, new officers are selected, committee assignments are established, and the next year's technical session developers are chosen.

From discussions with attendees during coffee breaks, lunch, and the Technology Trade Fair and Reception as well as comments at the conference critique meeting, the quality of the conference technical papers was exceptional and many favored returning to St. Petersburg soon.

The exceptional weather drew attendees to outdoor activities during their free time—some took to the beaches, while others made the rounds at golf. The hotel was well-situated, for directly across the street was Al Lang Stadium, spring training home of the St. Louis Cardinals. In addition galleries, museums, and the Pier were also close by.

Next year's Nonwovens Conference and Trade Fair will be held March 11–13 at the Adams Mark Hotel in Charlotte, NC. Proceedings from the 1995 conference are available from TAPPI PRESS. Member price is US\$ 55, nonmembers pay US\$ 82 (Order No. 0105 1395). 