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Nonwovens In The Home • Airlaid Makes A Comeback



The Comforts Of Home

nonwovens make themselves comfortable in the home furnishing sector, from bedding & window treatments to wallcovering applications

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In home furnishing applications, nonwovens are feeling right at home as they continue to replace foam in a variety of end uses and offer lower cost ratios, added value and higher performance. Today, nonwovens can no longer get away with just straightforward comfort and durability,

requirements such as flame retardancy (FR), antimicrobial properties and environmental friendliness are quickly becoming industry standards. What's more, nonwovens are managing to keep up with interior design trends and the increasingly fashion-forward demands of homeowners.

A 'Hot' Issue

If ever there were a hot topic in the furniture and bedding industry, it is the current push toward flame retardancy for mattresses and other bedding-related products. In the U.S., the big news centers on pending national FR legislation for the mattress industry and California's new open-flame mattress standard (Technical Bulletin 603). Standards currently aimed at bedding products are expected to spread into other areas of the home furnishing market as well and manufacturers are busy preparing for the changes these requirements will bring.

"One of the most notable changes to hit this industry was the introduction of the California open-flame mattress standard, which opened up a whole new market that didn't exist three years ago, and the roll-out of the standard on a national basis," observed Rick Pearce, senior director of PGI Nonwovens. The company supplies FR nonwovens designed to help bedding manufacturers meet the new standards. These materials are also targeting window treatments and other applications.

Through its partnership with Hanes Industries, PGI's FR materials are being used by major bedding manufacturers as facing fabrics for the bottom of no-flip mattresses sold commercially in California. "We expect this to be a growth area as FR legislation is enacted nationwide in 2007 and as the market for FR products expands to include other bed clothing items, upholstery and furniture," said Mr. Pearce. "Nonwovens also are a bigger component of products such as mattresses, driven by consumers' desire for greater comfort. No-flip mattresses have increased from 20% of the market to 80%. Latex foam mattresses also continue to gain in popularity."

Another company leading the way in this area is Carson, CA-based Western Nonwovens, Inc. (WNI), which is organized into three separate operating divisions—industrial nonwovens, performance insulation (PI) and Cerex Advanced Fabrics. In its industrial nonwovens division, the company has unveiled a family of flame retardant barrier products for the mattress industry under its Esyntial Safe brand.

"With more than 20 SKUs produced on 13 manufacturing lines in six locations across the country, this divi-

sion has been meeting the needs of mattress manufacturers in California and across the country for more than two years," said WNI president and CEO Ken Hardin. "The primary value focus for our customers has been developing FR barriers that are more affordable to use, offer more fill power and resiliency and continue to allow the mattress producers to merchandise their lines with value-added selling features such as exotic fibers and antimicrobial FR products."

Strengthening its position in FR mattress barriers, WNI is now also offering Esyntial Safe barriers laminated and embossed to the customer's choice of ticking fabrics. This is expected to represent a substantial cost savings for mattress producers while allowing them to continue to make their fashion decisions with ticking fabric selection.

Additionally, WNI's Cerex division has commercialized its new Spectramax line of branded products for end use applications in home furnishings, embroidery backing and other areas. The new nylon 6,6 denier spunbond fabrics feature improved uniformity at extremely light weights where nylon's advantages—strength to weight, high temperature resistance, abrasion resistance, excellent dyeing, printing and chemical resistance—can be exploited.

Through its PI division, WNI has introduced a family of fine denier fibers and updated its continuous filament technology to expand into the insulation business. The resulting products, branded as Climashield, have excellent uniformity and thermal efficiency for sleeping bags, outdoor apparel and comforters. The new process allows the PI division to engineer the loft, softness and other aesthetics required by the home and outdoor retail industries.

Spreading Like A Flame

Precision Custom Coatings (PCC), Totowa, NJ, is also active in the FR mattress area. The company supplies its Precision Flame Protection line of products for the FR mattress barrier market and has recently developed a highloft FR product for the same market. "The initial reaction from the market is very positive," reported Shaile Dusat, PCC's director industrial sales.

The company has also unveiled a variety of new home furnishing products including Bukram for cur-



A nonwoven roll being split on one of PCC's machines. The company supplies a variety of products for the home furnishing market.

tain headers (both sew-in and fusible), curtain liners for room darkening and insulation purposes, under-floor layments and RV furnishings. "We are developing new products and processes in all areas of nonwovens and coatings," added Mr. Dusaj. "We are constantly working with new developments in fibers, along with coatings and coating technologies, to bring new products and solutions in a cost effective way to the market." Beyond bedding, PCC is pursuing home furnishing end uses such as window treatments, antiskid fabrics and skirt liners.

"New products are getting favorable responses from the market," he continued, "however we are under constant price pressure from raw material suppliers. Customers are always asking for more cost effective products and we are constantly innovating to give our customers comparable products (as related to performance) at better prices."

Glass fiber specialist Owens-Corning, Toledo, OH, is another company focused on boosting the mattress industry's ability to comply with open flame fire resistance legislation. Through its North American veil busi-

ness, the company offers a Fire Resistant (FR) Filler Cloth, which is comprised of fire resistant and self-extinguishing fibers. The cloth is seamlessly bonded to standard non-FR filler cloth, which then looks, feels and installs like traditional materials that are used on the bottom of no-flip mattresses. Together, the materials are inherently fire-resistant without additional chemical treatment, effectively shielding foam and other flammable comfort materials within the mattress and foundation. The patented product also meets other industry standards for grab, tear and elongation strength.

"While compliance with new regulations often results in costly or complicated process changes," explained J.P. Blanchard, market manager for OC Veil Technologies North America, "Owens Corning (FR) Filler Cloth provides a one-of-a-kind solution that meets this challenge by fitting into the existing manufacturing process and, because there is no change in the way the product handles, requires no employee retraining."

Advancements in flame retardancy are also being made on the raw material end. One example is Basel,

Switzerland-based Huntsman, which, through its textile effects business segment, has launched a new flame retardant for polyester and cotton and their blends. Combining high performance with cost-effectiveness, Flovan CWF leaves treated textiles with a soft hand. The product, for which a patent application has been submitted, contains phosphorus and nitrogen and is free of halogen. Applied by padding, Flovan CWF is compatible with selected polymers, fluorochemicals and softeners. In the furniture and bedding sector, it is suitable for products such as curtains and mattresses.

A+ Antimicrobials

In addition to flame retardancy, customers in the furniture and bedding segment are also looking for antimicrobial features to protect against bacteria, mold and yeast. In response to these demands, Ciba Specialty Chemicals offers a range of silver- and glass-based antimicrobials, Ciba Irguard B 7000, which has gained approval by the Oeko-Tex Association in spinmelt applications for fibers and nonwovens used in items such as home textiles, clothing and bedding materials. The Oeko-Tex Standard 100 was created in 1993 to address the increasing demand for garments and home textiles to be free from any substances that might pose a risk to human health as well as to provide a specific in-use quality standard.

Irguard B 7000 antimicrobials offer a special glass matrix that allows controlled release of silver ions. The products are designed for use in polymers processed at temperatures up to 500°C and provide high protection against light-induced discoloration. These properties make Irguard B 7000 antimicrobials especially suitable for thin items such as fibers for textiles, nonwovens, tapes and transparent applications.

Replace, Replace, Replace

Not only are nonwovens replacing foam products, new,

highly engineered substrates are being used in lieu of more traditional nonwovens technologies. At PGI, this trend can be seen as spunlace products take over traditional needlepunch applications. "We continuously work with customers to develop engineered materials tailored to specific end uses in home furnishing applications," said PGI's Mr. Pearce. "We are seeing spunlace and other materials increasingly used as an alternative to needlepunch as they offer improved strength and durability. They are also receptive to advanced finishing techniques and are aesthetically appealing." PGI uses its proprietary Apex technology to incorporate three-dimensional images, improved uniformity and fabric formation on materials used in mattresses and other applications that give them the look of woven or stitched fabrics used in textiles. "We also can add colors to our fabrics using advanced technologies," added Mr. Pearce.

"PGI is seeing a growing trend in the use of engineered materials for home furnishings tailored to specific end uses—ranging from basic bedding to window treatments and decorative accessories—as a replacement for traditional materials that don't provide the high performance attributes consumers are demanding," he said.

In the bedding segment, nonwovens are serving as an alternative to down and meeting hypoallergenic requirements.

WNI's performance insulation division recently introduced Elite by Climashield, a down alternative for comforters based on fine fiber continuous filament insulation technology. Offering the warmth and feel of down with hypoallergenic performance, the continuous filament technology ensures durability by eliminating clumping and separating of the insulation over time or with washing.

WNI is also seeing opportunities for synthetic nonwovens in many foam replacement applications where



Two new nonwoven wallcoverings offer improved installation and strippability: one (left) is HSV's WallTak and the other is EasyLife from Ahlstrom (right).

they represent a cheaper alternative to expensive lower density polyurethane products. "The technology to densify synthetic nonwovens to compete with foam has advanced and continues to progress to the point where densified synthetic nonwovens are a more practical and cost-effective solution in many application areas of the home furnishing industry," said Mr. Hardin.

Up Against The Wall

One interesting potential growth area in this sector for nonwovens is wallcoverings, which was known as "wallpaper" up until just a few years ago. Industry trends for wallcoverings tend to focus on designs, colors, texture, flock, wet look effects, metallics, matte surfaces and stained glass effects, to name a few.

Due in part to the challenges homeowners have faced in installing and stripping traditional wallpaper, the North American wallcoverings industry has seen sales slide from \$4 billion to \$600 million in less than 20 years. In fact, mega-stores such as Home Depot have dropped the sales category altogether.

"The industry is shrinking at a time when most consumers agree that the print quality, variety of color and creativity of design has never been better, but sales continue to decline," stated Jim Vogt, director of marketing, nonwovens for H&V's industrial specialties business. "However, with the development of nonwoven substrates, first in Europe and now in North America, a real fix exists to the problems that most trouble consumers. Unlike paper and paper-backed vinyl, wallcoverings printed on nonwovens are fully dry strippable, remain breathable after printing (reducing the risk of mold and mildew) and most use no PVC, meeting the desires of environmentally conscious customers."

In 2004 H&V introduced wetlaid nonwovens for residential wallcovering. Designed to address customers'

complaints about the difficulty of wallpaper removal, WallTek products are easy to hang, are dimensionally stable (eliminating seams) and will dry strip from the wall in a single sheet without tools or chemicals. More than 20 collections from wallcovering manufacturers such as York, Chesapeake and Seabrook feature WallTek substrates.

In the fourth quarter of this year, H&V plans to introduce HollTek, a 450 gsm, non-PVC Type II breathable commercial wallcovering substrate. "HollTek will answer the industry's call for an environmentally friendly product that reduces the risk of mold and mildew behind covered walls," stated Mr. Vogt.

Another key player in the wallcovering area is Ahlstrom, which offers substrates ranging from facings and backings to wall liners for both prepaste and paste-the-wall applications. Ahlstrom's EasyLife nonwoven wallcoverings are designed to offer profit-enhancing opportunities for converters and manufacturers. Made with long synthetic and natural fibers, the substrates deliver high-performance production advantages: good runnability, low dust levels, less downtime and better print production.

"Our nonwovens facilitate endless variations in structure and surface effect," commented Larry Kinn, Ahlstrom's general manager, industrial nonwovens—Americas. "These wallcoverings are easy to install and remove, so decorators are changing their walls more often and retailers are selling more. The materials are stable; they don't shrink or expand when paste is applied, so seams do not separate. Ahlstrom has engineered benefits into substrates so they are strippable and easily removed from the wall. Our range of EasyLife nonwoven wallcovers are not only strippable, they are printable and breathable."

Ahlstrom has noticed a heightened awareness of nonwoven

substrates in the North American market. According to Rick Burdick, wallcover business manager at Ahlstrom, "We attribute this to the array of products and performance characteristics being offered." He added that high-end residential and commercial wallcoverings are growing because they are more fashionable and closely associated with respected designers.

A Smart Choice

In addition to flame retardancy, antimicrobial features, high performance and ease of use, nonwovens also make sense in economical terms compared with traditional home furnishing fabrics. "Nonwovens in general can provide an economic alternative to traditional fabric making processes," opined PGI's Mr. Pearce. "For example, the insulating properties and economical manufacturing processes of FR fabrics provide superior value."

At WNI, internal process advancements allow the company to offset rising energy and raw material costs, minimizing inflationary pricing actions to customers. "Our new process technology for producing continuous filament insulation is highly automated and requires very few personnel to operate," stated the company's Mr. Hardin. "Additionally, the new spreading technology minimizes the energy required to bond and form the insulation batting, drastically lowering energy consumption." As for the product technology, the company reports that continuous filament products offer its customers significantly less quilting-related costs than staple fiber insulation when assembling sleeping bags, apparel and comforters.



photo courtesy of WNI

WNI's Esyntial Safe FR barriers are designed to simultaneously provide flame protection, loft and resiliency without the need for expensive sacrificial materials to fill out the mattress cavity. This has significantly minimized the cost to mattress manufacturers for converting their lines to be FR compliant, according to the company.

Similar cost-saving efforts are underway at Ahlstrom. "We are working with our customers to ensure that our products provide the lowest overall total cost. Ahlstrom offers differentiated products that assist our customers in bringing a fresh look to the market. Ahlstrom's success depends on the success of the customer's collections."

From H&V's perspective, the future of the wallcovering industry holds several challenges for nonwovens with regard to cost-efficiency. According to Mr. Vogt, although nonwovens can outperform wallpaper in ease of installation and strippability, nonwoven substrates cost more than coated paper, adding about 75 cents per single roll (28 square feet) at the manufacturing level. "While we believe that North American homeowners will pay more for a product that works, the product needs to really work. The industry has another chance to deliver on its promise of great color and design, easy installation, no seams and, above all, strippability that allows removal in a single sheet without tools or chemicals. But if the customers are lied to again, they are likely to be gone, this time for good."

Fast Forward

Moving forward, suppliers agree that the future looks bright for nonwovens in the home furnishings market despite certain challenges, some of which revolve around the pending national FR legislation. "This is taking up a large amount of time and energy in the mattress industry. We see universal pressure to reduce costs to better compete globally and help make the transition of the U.S. mattress industry to FR compliance as cost effective as possible," said Mr. Hardin. "We see FR national legislation expanding into the furniture and bedding segments by the end of the decade." Finally, he noted that FR legislation is now underway in Canada, which represents another growth area for FR barriers.

PCC predicts a similar future trend in FR standards. "Stringent flame retardancy requirements for mattresses and box springs are just the tip of the iceberg, and FR requirements will continue to dominate the home furnishing sector," predicted Mr. Dusaj. "We are going to see stringent flame retardancy requirements go beyond the foundation of beds and soon everything that goes onto the bed, into literally every room of the house. PCC likes to look ahead of trends, anticipating new laws and finding creative, cost-effective ways manufacturers can quickly and easily respond to them with products that provide superior compliance, value, safety and quality."

As for PGI, the company expects to continue to see consumer needs evolve to require more specifically engineered high performance products. "Technology and innovation will be the factors that differentiate suppliers," concluded Mr. Pearce. ♦