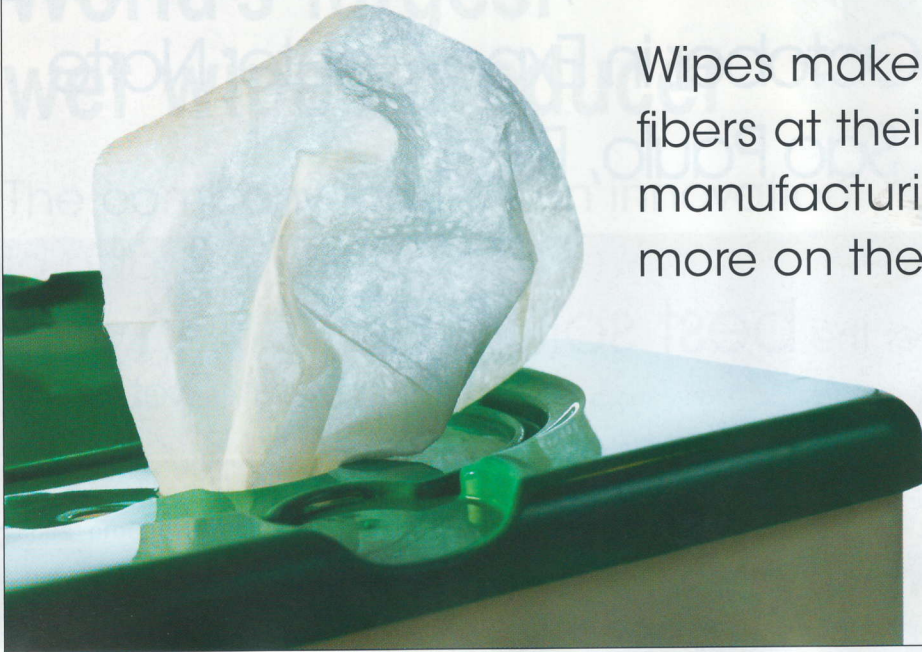


Wipes With Recycled Fibers



Wipes makers have recycled fibers at their disposal for manufacturing, with perhaps more on the way.

By Steve Katz

Environmental sustainability is not a fad. Survey most any industry, and chances are, at or near the top of the list of major issues at hand, is how to become and maintain an eco-friendly business. Consumers are demanding it, and in turn, brands are passing on the need to source sustainable materials to their suppliers.

Reduce. Reuse. Recycle. These three words have become synonymous with the Green Movement. But in the nonwovens wipes industry, they're tricky to apply. After all, a wipe is a product that is not reused – it's discarded after use. And as a cleaning product, wipes are in direct competition with reusable rags. But when it comes to recycling, however, wipes manufacturing has made some serious headway. While the wipes themselves won't get tossed in the recycle bin after use, it's how they're being made that counts, as they can be produced using a variety of recycled fibers.

With demand for consumer and industrial wipes being forecast to increase 4.3% per annum to \$2.3 billion in 2014, market research firm The Freedonia Group says demand will actually decelerate from rates achieved from 2004 to 2009 due to increasing market maturity and a shift in preferences to more environmentally friendly consumer goods and cleaning methods. So, in response to the green trend, wipes manufacturers can appeal to consumers by developing more environmen-

tally friendly products, such as those that are not only biodegradable, but also made from recycled fibers.

The demand is there. And organizations and manufacturers alike are researching and developing ways to convert these recycled fibers into wipes, and some have already hit the market.

PET project

"Use of recycled fibers produces an equivalent wipe product and goes through the same testing and approvals as virgin, yet it is environmentally friendly and sustainable," states David Poole, CEO of Poole Company, a Greenville, SC distributor of recycled fibers and PET fiber. PET (PolyEthylene Terephthalate) is a strong but lightweight form of clear polyester, used for beverage containers.

Poole Company offers EcoSure, a recycled fiber available as an end use wipe. EcoSure falls into the category of a post consumer recycle (PCR) product. "PCR is the 'highest' level of recycling, meaning it is specifically diverting items from a landfill that have completed their intended use," Poole explains. "For example, empty plastic water bottles (PET) are used to create EcoSure fibers and otherwise would be destined for a landfill. Poole Company takes a product created as disposable – the water bottle – and is able to diminish the negative impact on the environment by recycling it into fiber and giving it another life."



Plastic water bottles become wipes and other nonwoven products with Poole Company's EcoSure recycled fibers.

The environmental impact of recycling PET, according to the National Association for PET Container Resources (NAPCOR), includes reduced energy consumption by 84% and greenhouse emissions by 71% (compared to using virgin fiber). Annual recycling of 1.5 billion pounds of PET containers into fiber resulted in 46 trillion BTUs of energy saved – enough to power 486,000 US homes for a year. It also resulted in 1.25 million tons of greenhouse gas emissions kept out of our atmosphere, which, according to NAPCOR, is equal to the removal of 190,000 vehicles from US highways.

These are some pretty impressive numbers. Here's more: 85 16-oz PET bottles will produce the fill for one sleeping bag, five two-liter PET bottles will make one square foot of polyester carpet, an extra large T-shirt or filling for a ski jacket.

Using similar methodology of NAPCOR, Poole Company applied calculations to the nonwovens market, and determined that five 16-oz PET bottles will produce one 72-count box of wipes (based on 52 gram wipes made with 70% EcoSure and 30% other). And five 16-oz PET bottles will produce the acquisition distribution layer for one 72-count box of diapers.

"EcoSure fiber is a sustainable option for consumers and manufacturers wanting to be environmentally responsible. It is an excellent alternative to virgin fiber and with equivalent quality," David Poole says, emphasizing that while EcoSure is an excellent alternative, the quality of the wipe is not sacrificed, and even results in a softer product. "An additional benefit of using a recycled fiber such as EcoSure for wipes and nonwoven applications is a softer, gentler product, as a result of Poole Company's proprietary processes, and because bottle polymers are designed to be more elastic compared to virgin-fiber polymers. The

fiber polymer chemistry helps with fiber tactile properties versus virgin-polymer fibers," he says.

The process of how a PET bottle becomes a nonwoven wipe starts when the bottle is collected by independent private and public collection agencies. Then the PET undergoes a rigorous sorting and washing process and ground into flake. "This sanitization process for EcoSure meets the same standards as the recycled flake that goes into producing soda and water bottles," Poole says.

During the fiber-making process, the flake is melted down at 290°C into liquid polymer. The liquid polymer is extruded and spun into polyester staple fiber using the same process as high-quality staple virgin fibers. The fiber is purchased and used by manufacturers to produce nonwoven fabrics, using spunlace, thermal or adhesive bonding, as well as needlepunching processes. "The fiber is also widely used in textiles and industrial products, again performing equivalent to fibers made from virgin polymer, yet with sustainable advantages," says Poole.

EcoSure fibers range from 1.2 denier to 500 denier and are made from 100% PCR PET. "Very few manufacturers can make the whole gamut of denier using recycled fibers," Poole says, adding that EcoSure is available as a true 1.2 denier for hygiene-grade technical nonwoven operations all the way up to a 500 denier for production of industrial scrub pads.

"Generally speaking, softer fabrics require a smaller denier, which Poole Company is successfully able to produce with a recycled fiber," says Poole. "EcoSure is suitable for hygiene (wipes, diaper linings, etc.), industrial nonwoven products (industrial wipes, furniture, automotive, filtration, insulation, scrub pads, foam-replacement seat cushions), geotextiles for erosion control such as American Excelsior Recylex, where 100% of loose web is made from EcoSure and all types of textile products such as apparel, socks and home fabrics.

"EcoSure is a very good fit for single-use items like wipes where earth-friendly and sustainable issues are problematic. Wipes with virgin content are used once and thrown away. Wipes made with EcoSure fibers essentially have two lives – its life as the original PET product and its life as a wipe – doubling its intended use and therefore reducing the environmental impact and giving a product a second life," Poole says.

Poole Company made EcoSure third-party certified by SCS (Scientific Certification Systems) in 2010 – the first in North America to receive certification in PET staple fiber. And the certification was renewed in 2011. To date, less than five companies worldwide have this distinction in the PET category.

"Years ago, sustainability efforts in nonwovens were

primarily focused on packaging. More recently the market shifted to using eco-friendly methods in the manufacture of wipes, and this is primarily done in one of two ways. Today, some wipes are made from recycled materials such as PET while others address sustainability through decomposition efforts (PLA) that require specific environments and conditions to biodegrade.

"Although each has environmental positives and varying levels of success, both processes impact the ecosystem differently with vastly different carbon footprints and results. Another interesting note is that, in theory, nonwovens made from EcoSure could be recycled again and given an additional life, if advances were made in the collection of recyclables market. For example, Poole is undergoing this now with a customer in the woven and knit market where the institutional product will be manufactured with EcoSure, and at the end of the products' desired life, it will be recycled and then put into new life once again. By using EcoSure, the product has the ability to be recycled and repurposed again and again, extending or diverting it altogether from a landfill. Giving a product that was once disposable a new life – or two or three – is special."

Picking cotton

Cotton products have been recycled for quite some time, long before the sustainability revolution. Cotton jeans, t-shirts, shirts and other clothing, plus sheets, towels, etc. have been donated or re-sold through thrift shops for decades. More recently, cotton products (clothing, home textiles and cutting room scraps) have found new, recycled lives in different products. After the trimmings – zippers, grommets, etc. – are removed, the raw materials are transformed through processes like ginning back to a fiber form and baled. This cotton then becomes a raw material for other uses. And the wipes market is one where the life of a cotton fiber is getting extended.

"Recycled cotton has been used for wipes and is expected to grow over the years to come," says Jan O'Regan, director, strategic initiatives, Global Supply Chain Division, Cotton Incorporated, a nonprofit organization based in Cary, NC, USA, that's dedicated to cotton research and marketing. "Cotton Incorporated touches every point of the cotton value chain from research into seed and soil to textile chemistry, technical support in manufacturing plants and of course, sustainability," she says.

Cotton's use as a wipes fiber has been a growing trend in recent years, as myths regarding its efficiency and compatibility on nonwovens-making equipment have been challenged and overcome. (See *Household & Personal Care Wipes*, September 2005).

For an indication of cotton's successful penetration

into the wipes market, look no further than Rockline Industries' Regenerated Cotton Wipe. The product won the Visionary Award for the most innovative use of a nonwoven in a consumer product for 2010. "Although this particular wipe was a brand sold in England, Rockline has also worked with recycled/regenerated companies for US product lines," O'Regan says.

"Many nonwovens manufacturers that produce spunlace material for wipes have at least tested the use of these fibers," O'Regan says, adding, "The advantages are many, including variability in length – recycled cotton fiber is likely to be more variable in length than virgin cotton, which by its nature has variability. This might or might not have an impact on carding," she says, noting that another advantage of using recycled cotton is the assurance that no dark colored fibers find their way into a bale of white fiber – an issue that a user doesn't have with virgin fiber.

Cost is another factor. Recycled cotton fiber is considerably less expensive, according to O'Regan, but it's cotton's sustainable attributes that she keys in on. She says, "Cotton has a great sustainability story. It's a product of Mother Nature. It has been supporting life on earth for many thousands of years. It is annually renewable. Cotton provides food as well as fiber. The seeds are high in protein and in demand as feed for cows. The stems, branches and burrs left on the fields provide nourishment for good soil health. Cotton fiber is 100% cellulose. It comes from Mother Nature and returns to Mother Nature through a natural biodegradation. In fact, in a compost pile, it biodegrades more than 90% in 28 days. Recycled cotton has an even better story. In addition to all of the above, the multiple use of the same raw material provides more sustainable benefits from the same crop."

SMART thinking

The Secondary Materials And Recycled Textiles association is an organization devoted to the recycling cause. An international organization, and one that's been around since 1932, SMART has a hand in all facets of the recycling stream.

Successful recycling relies on interdependence, and this is one of the SMART's themes. Reusing and recycling is effective when there is cohesion and communication between the raw material source and the product manufacturer. And in the case of wipes, SMART has developed an extensive network of companies from both the supplier and manufacturing sides, and also in the realm of education, advocacy and community.

"SMART as an organization has only three markets to look out for and represent: wipes, used clothing and tex-

Emerging Markets:

tile fibers. SMART's mission is to reduce the amount of textiles going into landfills by finding new uses for them," explains Larry Groipen, president of the SMART executive boards, and also president of ERC Wiping Products, Lynn, MA, USA.

Groipen says being a member of SMART is a valuable business tool for both the manufacturing and sales segments. "SMART members collect, sort and process textiles from both post consumer and post industrial markets. Other SMART members manufacture, convert, package and sell wipes made from recycled fibers. SMART members that sell wipes supply them as a primary item rather than a secondary item such as a Jan-San or industrial distributor. Therefore, SMART members tend to sell more wipes," Groipen says. "SMART members are a source of raw materials for fiber producers and wipe producers. SMART members are also an outlet for off spec material."

But when it comes to nonwovens wipes being manufactured from recycled textiles, it's something that SMART member are unsure about, but certainly is something that they want and expect to see. "As for

wipes made with fibers from post consumer textiles such as clothing or household textiles, there might be issues relating to impurities that technology has not caught up with. In the perfect world, textile fibers would give strength and absorbency to a wipe," Groipen says, adding, "I would like to see some experimenting take place because SMART is working with local, state and federal recycling agencies to encourage more textile diversion from landfills. And without greater markets for fibers made from clothing, there may be a limit on how much can be recycled."

Groipen emphasizes that SMART members would like to see wipes made with recycled fibers. He says, "It is our hope to encourage SMART and INDA members to work together to develop these wipes. If a wipe could be produced using post consumer textile fibers from clothing, there would be a great selling message. It would certainly highlight the value of disposable wipes over rented shop towels."

For more information about SMART, visit www.smartasn.org. HPCW

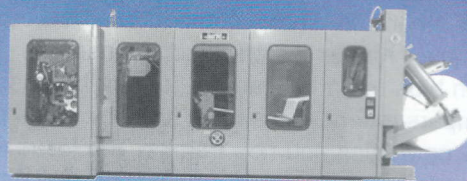
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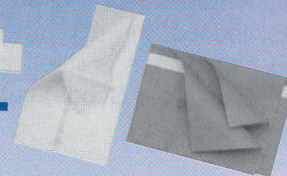
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