

## RECYCLED PET IN TAIWAN

# Seeing it through

Nüwa Textiles has developed an alliance with some of Taiwan's most reputable recyclers and textile firms to give a highly transparent route to recycled polyester fabrics. Kathy Swantko reports from Taipei.

We're now living in a world where the 'green' movement is exploding across a variety of industries and the textile and clothing supply chain has somewhat belatedly responded to the call by changing or modifying business practices and production procedures in some sectors.

From fibre production to finished product, this issue is becoming ever more important for consumers, brands and retailers and 'eco-transparency' is now also the goal of many fabric manufacturers, which is definitely not an easy or an inexpensive transition to make.

As with other industries, there are companies that are so focused on being able to capitalise on this popular phenomenon, or to advertise that they are "green", but have searched out or changed only a small aspect of their business in order to be able to make these claims.

Michael Shih, president of Nüwa Textiles (pronounced New Way), refers to this as "greenwashing", and says he is on a mission to show the outdoor industry, and other industries along the way, that the 21st Century "New Way" for producing environmentally friendly textile products from start to finish, involves running all supply chain production facilities in complete transparency.

Shih explains, "Countless 'green rush' products and claims are sprouting up, and in the textile industry, this brings mixed results. While recycled

PET products reduce fossil fuel usage, it irks me to see products labeled as 'green' when clearly they are not. One example is when the 'green' label is applied to a recycled polyester fabric, which has been backed with PVC. Designers, retailers, and consumers deserve an authentic, honest and dependable voice that is reliable."

While the ability of being able to be completely transparent may seem like a monumental task to achieve, and something that could take years to fulfill, Nüwa Textiles, an innovative Tustin, California, based textile company, along with its coalition of supply chain companies, claims to have embraced the eco-issue as its benchmark for production and invited *Ecotextile News* on its 2008 'One Step at a Time' tour to view at first hand its production of recycled polyester and 'The True Shade of Green' textile products into finished luggage and backpacks on the retail sales floor.

### PET bottle collection

Nüwa Textiles has established a unique partnership with the non-profit organisation, Tzu-Chi Humanitarian Center in Taipei, Taiwan, to ensure the source of its PET recycled fabrics are made with recycled PET bottles, collected from 100% post consumer use, while taking an extra step to provide a great societal good.

A home-grown Taiwanese organisation, founded in 1966 by Dharma Master Cheng Yen in the

impoverished east coast of Taiwan, the Tzi-Chi Foundation has been contributing to a better society in Taiwan for nearly 40 years through a variety of community service focused programs. Today the Foundation is a global international organisation with over 5 million supporters and over 30,000 certified commissioners around the globe. Its 120,000 Taiwanese volunteers work in a variety of humanitarian projects and one of its key programs involves the collection, crushing, and bailing of post-consumer plastic bottles for recycling purposes, which provides the first step in Nüwa Textiles' production of recycled polyester for use in its fabrics for the outdoor market.

For the conversion of the used plastic bottles into PET recycled chips, Nüwa Textiles partners with Oriental Resources Development Ltd, which started in 1984. It was the first recycling facility in Taiwan and began recycling of plastic bottles in 1989.

The process of recycling PET bottle flake production includes the pre-washing, de-labeling, sorting, and the grinding of the plastic bottles, followed by the drying, and packing of the PET flake for shipment to the fibre producer. Today Oriental Resources Development recycles 900 tons of recycled PET flakes per month from post consumer bottles and is currently in the process of boosting its recycling capacity to 2,000 tons of recycled PET flakes per month.



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## Polymerisation

At the next production stage Nüwa Textiles' works with Chung-Shing Textile Co. Ltd where the recycled PET chips are polymerised and extruded into recycled polyester fibre. Chung-Shing Textile Co. Ltd is known for its 'GreenPlus' fibre brand.

Based on data provided by Chung-Shing Textile Co., the quantity of recycled PET bottles in Taiwan has grown from about 10,000 tons per year in 1997 to nearly 110,000 tons in 2007. Of that amount, the Chung-Shing spokesperson explained that 60% of that goes into fibres, 30% goes back into plastic bottles, and 10% goes into films.

The spokesperson claims that Chung-Shing Textile's 'GreenPlus' fibre can reduce 77% of CO<sub>2</sub> emissions during the production process, saving 84% of the energy normally used in PET production. GreenPlus is approved by the Environment Protection Administration in Taiwan, and also meets the Oeko-Tex certification standards.

## Fabric production

Viewing the production of the woven recycled polyester fibre was the next step in the Nüwa Textiles tour through Taiwan. Honmyue Enterprise Company Ltd. and Sunny Special Dyeing & Finishing are the primary members of Nüwa Textiles' eco-alliance.

With over 1,000 weaving machines producing over 20 million yards of fabric each month, Honmyue is the largest fabric weaver in Taiwan. As part of the Nüwa Textiles' "One Step at a Time" sustainability program, Honmyue Textiles, which in 2007 was a US\$130 million business, is about to embark on a major environmental initiative. It says it is committed to achieving three major objectives in its green initiative: resource conservation, pollutant reduction and environmental protection.

In early 2008, Honmyue completed its ISO-14001 Environmental Certification and the company now recycles 70% of all water usage for running its weaving machines, which amounts to 1,600 tons of water each day. This makes Honmyue the first and only large scale weaving waste-water recycler in Taiwan. In addition, after a recent plant-wide replacement of all conventional lighting, the facility now maintains an energy saving lighting system, which utilises 33% less energy and equivalent carbon emissions.

Meanwhile, Sunny Dyeing and Finishing Co., established in 1984, is ISO-9001 Management Standard certified, Oeko-Tex 100 certified, and says it is now in the process of acquiring 'bluesign' certification. The company, whose production



Volunteers clipping off plastic bottle cap rings at the Tzu-Chi recycling centre.



Around 300 weaving machines at Honmyue's new energy efficient plant in Jaixing, China.

reached 33 million yards per year in 2007, specialises in the dyeing and finishing of Honmyue's high performance woven fabrics, including those containing spandex, low denier nylon and polyester.

Water conservation is high on Sunny Dyeing and Finishing's energy-saving initiatives. Charles Shih, managing director of Sunny noted, "Dyeing and finishing is perhaps the most energy and water consuming step in the fabric production. In the areas of resource conservation and environmental sustainability, it is Sunny's mission to set the bar higher than required."

The company has already replaced several of its dyeing machines with more energy efficient versions. These changes have resulted in a savings of 16,000 litres of water per day, per machine. Fifty percent of the remaining machines are scheduled for the upgraded replacements within the next 12 months. In addition, approximately 30%, or 265 tons of the water that comes through the plant is recycled. According to bluesign, Sunny only uses 86 litres of water per 1 kg of fabric dyed, which is far below the industrial average of 110 litres per 1 kg.

Sunny has also implemented a coal gasification system, which is currently one of the cleanest systems available in the textile industry for heating

the dye water and to power other heavy machinery. This system turns coal into a hydrogen-based gas under a high pressure gasification process that eliminates open air emission and pollution. The process produces SO<sub>2</sub> (sulfuric acid) as a byproduct, which is captured, recycled and used as a neutraliser in its waste-water treatment. Each of these updated and refined processes are currently in place within Nüwa Textiles' alliance companies to help meet the growing demand for energy efficiency and production transparency in supplying recycled polyester fabrics, and other eco-friendly finished fabrics targeted towards the outdoor consumer market.

By creating this coalition of companies dedicated to a more eco-friendly future, Nüwa Textiles believes that it has established a highly transparent production process which brands and retailers can trust. Larry Harrison, vice president of business development for Nüwa Textiles concluded, "The result of the journey so far is that now we have a beginning with recycled polyester, and a thorough rethinking of the entire process of sustainable fabric production for the future. While many challenges lie ahead, we are proud to have taken the first steps down this path."