

Getting in step with green

Resins made from renewable resources are making their presence felt in the shoe industry, where bio-based alternatives to petroleum-derived materials are providing an attractive option for end users to outline their green credentials. APN reports

Japanese sports equipment and apparel company Mizuno (www.mizuno.com) has taken the lead in embracing the use of the Pebax Rnew thermoplastic elastomer (TPE), made and developed by Arkema (www.arkema.com) from renewable resources, to make the Wave Technology midsole in four new models of running shoes debuting in 2009.

The move to adopt the use of bio-based TPEs is in line with Mizuno's environmental initiatives, and the Japanese firm will be the first in the athletic footwear industry to use the Pebax Rnew materials, specifically in both the men's and women's models of the Mizuno Wave Rider 12, Wave Inspire 5, Wave Creation 10, and Wave Nirvana 5.

The Pebax Rnew range of TPEs is based on Arkema's Amino 11 chemistry, where the chemical is processed from a vegetable source (castor oil) that does not compete with food production. The Pebax Rnew TPE's range of shore hardness is very wide, going from rubber-like behaviour material (shore A 75-80) to polyamide-like behaviour material (shore D 70-72).

A spokesperson from Arkema Japan explains that the TPE material was able to meet the performance requirements of the end application: "Pebax Rnew, besides being partially produced from renewable resources, is also a very high performing material. Compared to other thermoplastic elastomers



Mizuno is using the Pebax Rnew range of TPEs, made and developed by Arkema from renewable resources, to make the Wave Technology midsole in four new models of running shoes

such as polyurethane (TPU), Pebax Rnew is 20 percent lighter, has much better flex fatigue resistance and stable properties at low temperature, has unique dynamic properties (higher energy return) and outstanding UV resistance."

Currently, the Pebax range is produced via a block co-polymerisation process in Arkema's factories in Europe and US, while the materials firm is exploring options to set up compounding lines in China for its polyamide-related product range in the near future. "So far, both standard Pebax and Pebax Rnew materials are smoothly supplied to Asia from Europe and USA," says Arkema's spokesperson.

One of the winners of last year's Bioplastics Awards, organised by *European Plastics News*, was Brazilian footwear industry supplier Formax Quimiplan's development of renewable TPU-based shoe components.

Thermogreen is the latest range of counters and toe puffs (structural shoe components that reinforce the shoe and are

essential in maintaining the shape and comfort of each shoe) from Formax Quimiplan and is the first industrial-scale application of renewable TPU in the shoe industry.

The Thermogreen range provides shoe manufacturers with a reduced carbon emission alternative to traditional TPUs with no sacrifice in performance.

Merquinsa (www.merquinsa.com) developed the TPUs used to make the Thermogreen products. Aside

from the benefits from the sourcing of raw materials for the new resins, they also provide a lower activation temperature, making further energy savings

possible during moulding. Any scrap and trimmings from the production process can also be recycled back into new production, further minimising environmental impact.

In related product news, Merquinsa continues to push the sustainability agenda with the development of what it claims to be the world's first ether-based bio thermoplastic polyurethane grades.

The new development is the latest addition to the growing bio range of TPU grades from Merquinsa for varying injection moulding, extrusion and adhesive applications.

The new bio TPU grades, with renewable content up to 60%, will be marketed under the Pearlthane Eco brand as a viable alternative to petroleum-based TPU and TPE products. The Pearlthane Eco platform is said to have strong mechanical properties, abrasion and scratch resistance, processability and material recyclability.

Formax Quimiplan developed renewable TPU-based shoe components using materials from Merquinsa

