

## FOOTWEAR TECHNOLOGY: BLOOM



US company Bloom has found a way to turn potentially harmful algae into a foam material that can be used to create shoes. Its new brand partner believes this foam could revolutionise the footwear industry.

# An algal alternative

**A**lgal bloom is a term used to describe the rapid build-up of algae in freshwater or marine water systems. It is caused when an excess of nutrients, from things like agricultural fertiliser or domestic cleaning products, find their way into the water and stimulate the growth of algae. This can have a severe impact on plant, animal and human life, as well as on the ecosystems that support them.

San-Diego based company Bloom has come up with a potential solution to this problem. Founded in 2015 as a joint venture between algae biomass harvester Algix and product material development company Effekt, it takes its name from the phenomena it aims to combat. It has devised a method for converting algae biomass collected from freshwater sources, such as rivers, lakes and ponds, into a foam suitable for use in footwear. The goal is to provide the footwear industry with a more sustainable foam material, while also helping to keep the

environment in balance.

Bloom's parent company Algix uses a mobile harvest unit to filter water from freshwater sources that are at high risk of algal bloom. The water is pumped into the unit where it is mixed with a water-safe coagulant to make the algae clump together into what are known as flocs. These flocs are pushed to the surface and skimmed off into a collection tank. The algae is collected and delivered to a facility to be dewatered and dried via a solar drying process.

It is then converted into pellets before being expanded into a flexible foam with the addition of foaming compounds. The algae biomass forms the foundation of Bloom's foam, but it is combined with traditional EVA. The company says it is also possible to create PU, PVC and TPE foams using the material. The exact composition can be tailored to the needs of specific customers, but it typically contains between 15% and 60% algae content.

*Vivobarefoot has used Bloom's algae-based foam in its Ultra III running shoe, which it calls the "ultimate amphibious adventure shoe".*

 Vivobarefoot

### A rival for EVA?

Bloom describes the foam as a “natural polymer” and says its natural thermoplastic qualities match, or in some cases exceed, the performance characteristics of conventional closed-cell EVA foams. Among the advantages it offers are excellent tear strength, elongation and flexibility. It is around 8% to 10% lighter than EVA on average in sheet form, according to Bloom. The company also points out it is well-suited to injection moulding.

It believes this algae-based foam can offer a legitimate alternative to the synthetic and petrochemical foams that currently dominate the footwear market. As well as helping to offset the petroleum ingredients used in more traditional foams, Bloom’s foam is derived from a natural, abundant and renewable resource.

The process of collecting the algae serves to keep freshwater sources clean. After being filtered, the water is released back into the river, lake or pond with a 99.7% level of purity. This provides a clear water source for the ecosystems that plants, animals and people rely on. Removing the algae also reduces the amount of carbon dioxide released into the atmosphere.

### Sustainable shoes

UK footwear brand Vivobarefoot has partnered with Bloom to use the algae foam in the third generation of its Ultra running shoe. It is the first footwear to be completely made from the material, although it has previously been used as a substitute for EVA in midsoles. The fully waterproof Ultra III went on sale this summer, with the brand describing it as the “ultimate amphibious adventure shoe”.

The partners say that each pair of shoes contributes to the recirculation of 57 gallons of filtered water back into natural habitats. Each pair also prevents the equivalent of 40 standard-sized balloons of carbon dioxide from being

released into the Earth’s atmosphere. These figures are for a pair of men’s EU42 size shoes.

“Our goal is to deliver the most performance-driven materials in the most environmentally responsible manner,” explains Mike Van Drunen, CEO of Bloom. “It is a goal we constantly strive to improve upon, and we are excited to collaborate with Vivobarefoot on the new Ultra line.”

“This is a true revolution for the footwear industry with the first plant-based alternative to the petro-foams in ubiquitous use,” adds Galahad Clark, founder of Vivobarefoot. “We are thrilled to be the first company to use Bloom in our shoes and further our mission to make the perfect shoe that is perfect for feet and with minimal impact on the planet.”

### Prime potential

Bloom harvests algae from Mississippi and Alabama in the US and from locations across China. China is an ideal source of raw material as it has a considerable algae problem. As the world’s largest producer of footwear, and so a major user of EVA, it is also a potentially lucrative market for the company’s algae-based foam.

The current footwear applications for the material include insoles and footbeds, sock liners, midsoles, outsoles and other compression or injection moulded components. Bloom has active development programmes with 30 shoe brands. It also sees plenty of uses for the material outside of footwear including to give traction on the surface of surf or paddle boards, for industrial gaskets or seals, and as padding in furniture.

Although Bloom is marketing its algae foam as a more sustainable alternative to current materials, it is not 100% biodegradable. The company’s research and development team has been tasked with achieving this without compromising on the foam’s performance qualities. 

*A pair of men’s EU42 Ultra III shoes will help recirculate 57 gallons of filtered water back into natural sources.*

 Vivobarefoot

