CASE STUDY

Celanese

DIALING IN A PRECISE FIT FOR HIGH-PERFORMANCE FOOTWEAR

THE CHALLENGE

Adjusting the fit of high-performance footwear, such as ski boots, hiking boots and running shoes, while out in the field can be challenging. Extreme weather, rough terrain and gloves can make it difficult and time-consuming for athletes to find the right fit. That's why BOA® Technology created the BOA Fit System, comprised of a micro-adjustable dial, super-strong, lightweight laces, and low-friction lace guides. Each component is engineered to deliver a fast, effortless, precision fit. The BOA Fit System allows athletes and sports enthusiasts to adjust their shoes or boots to achieve a precision fit that allows them to perform at their peak of performance. BOA's customers integrate the system with their products, from snowboard boots and cycling and running shoes to medical bracing and workwear boots.

As BOA expanded from the outdoor industry into new, more-demanding industry sectors with diverse and more-rigid requirements, the company began looking for improved polymeric materials and suppliers for its dial platforms. BOA wanted to work with a global plastics manufacturer that could provide the polymers required for the various dial components, as well as robust application development and technical support for future products. The company needed exceptional engineered polymers that could surpass its existing materials in performance properties including high impact strength, colorability, weatherability, and moisture and high/low temperature resistance.

Product Description	Properties	
Reinforced Zytel® PA	Tensile Stress:	10000 MPa
	Unnotched Impact Strength:	75 kJ/m^2
General Zytel® PA	Tensile Stress:	3000 MPa
	Unnotched Impact Strength:	400 kJ/m^2
Toughened Zytel® PA	Tensile Stress:	2000 MPa
	Unnotched Impact Strength:	Non-break

THE SOLUTION

BOA found what it was looking for in Celanese and its advanced material technologies and technical support services. Celanese demonstrated through proven success that its Zytel® impact-modified polyamide 66 performed exceptionally well in highly critical conditions. Further, Celanese's comprehensive portfolio included multiple types of polyemers, including Hytrel® TPC-ET thermoplastic elastomer, which were needed for multiple components in different dial designs, offering BOA a valued source for its specific material needs.

Because the company offers a lifetime guarantee on its dials and laces, it was vital for the BOA team to have a high level of confidence in Celanese's material quality and consistency worldwide. This trust was a primary reason why BOA chose Celanese as a key materials supplier.

The BOA Fit System must deliver a fast response and reliable performance under a variety of demanding conditions. For example, trail running shoe dials must be resistant to impacts, while the dials on snowboard boots need to function well in very cold temperatures. The dial mechanisms must also be extremely strong and wear resistant.

Zytel® nylon resins meet these demands with consistently high performance. These materials offer a balance of stiffness and impact resistance, excellent surface finish and colorability, dimensional stability and weather resistance.

Celanese emphasizes connection and collaboration with its customers and also looks to deliver exceptional service and support through ongoing testing, processing guidance and other technical services for its engineering polymers. To assist with the creation of new dial designs for the BOA Fit System, Celanese's global, multi-disciplinary team worked closely with BOA's designers to fully understand their needs. To address these needs, Celanese provided a wide range of expertise and capabilities including material recommendations, colorant support, finite element analysis by computer-aided engineering staff, and local, rapid response regarding samples and product shipments. The Celanese team also assisted BOA with processing by troubleshooting tooling issues with mold flow analysis and melt flow rate.

THE SUCCESS

The high quality of the BOA Fit System incorporating Celanese materials has enabled BOA to lead the market in solutions for snowboarding, cycling, golf and safety footwear. The excellent reputation of these systems is helping to expand BOA's share of the trail and court footwear markets.

Looking ahead, BOA is strengthening its environmental efforts by using more sustainable materials. The company has committed to using recycled or sustainably sourced materials in 100 percent of its products by 2027. BOA will be working closely with Celanese to explore and implement sustainable materials to achieve this goal.

"Our successful collaboration with Celanese is founded on our shared values," said Cody Henderson, Director of Product Development Operations and Sustainability, BOA Technology. "Both organizations stand squarely behind their products with a commitment to the highest level of quality and service, while also focusing on enhancing sustainability. We will continue to rely on Celanese to help us design and manufacture innovative, next-generation products that will transform the fit and performance of the global footwear industry."

BOA FIT SYSTEM ANATOMY

DIAL

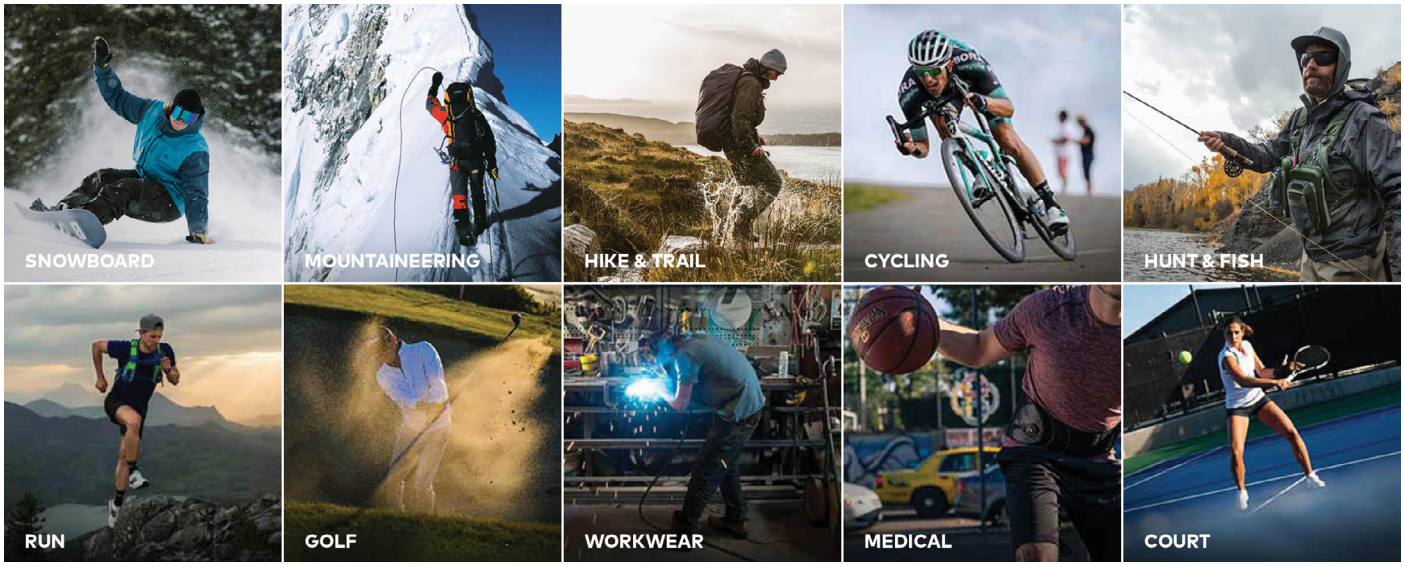
Varying in size, design, and user interface, BOA dials fine-tune fit with precision, allow for quick adjustment, and never settle on performance.

LACE GUIDES

Lace guides replace traditional eyelets and the deficiencies that come with them. BOA lace guides come in plastic or textile and are designed to minimize friction and distribute an even fit.

LACE

The workhorse of the BOA Fit System, BOA laces routinely tolerate the toughest environments and field tests, and are expertly configured for precision and performance.



Celanese

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