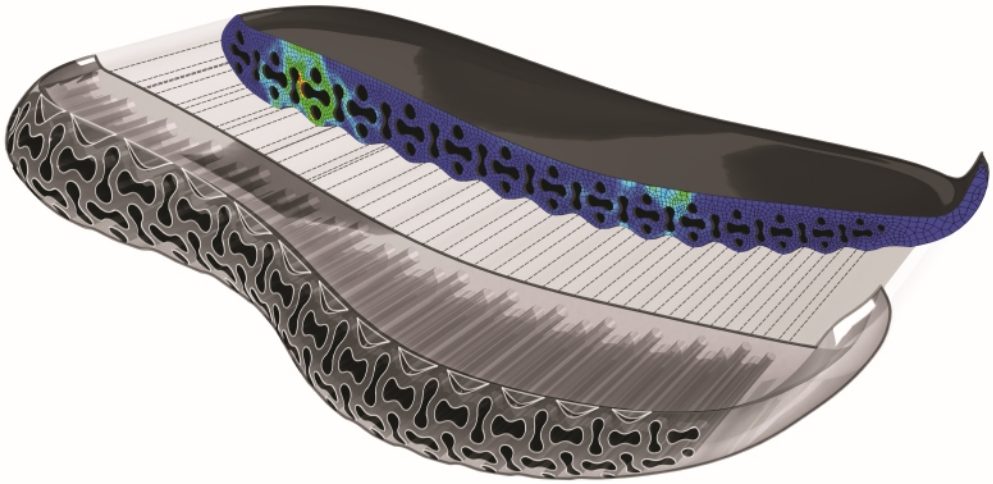
Massachusetts Institute of Technology

design lab

VISION SUMMIT '17

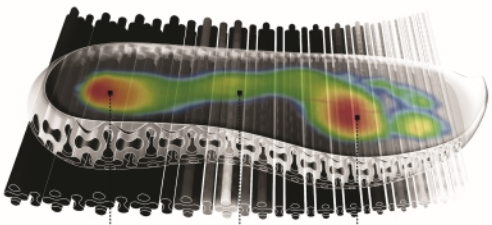
METARIDE MIDSOLE

Auxetic materials bring a fresh approach to shoe design by creating programable performance. For everyday wear, the specialized recurve pattern provides a extra soft, springy underfoot feel that adapts to the users foot. When it's time to run, the recurve pattern engages, self-reinforcing to create firm, yet elastic support. Through computational evolution, the recurve pattern can even be adapted to each athlete individually.



COMPUTATIONALLY DESIGNED

The auxetic metamaterial has been specially tuned using computational design and validated through digital simulation. In the heel strike and push-off phases, the material is programmed for adaptive cushioing and spring, while the arch area is programmed for midfoot stability. Combined with user data, the pattern can be easily customized for the individual athlete. With the power of scripting, unlimited variations in geometry and performance are possible.



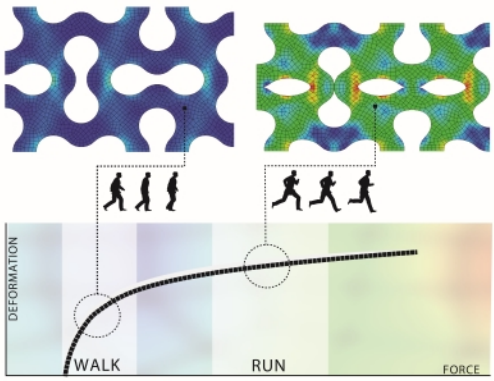
Large Recurve voids in the heel of the shoe provide an extra elastic response, helping to dampen impacts.

The arch of the Recurve midsole uses a tighter degree of fold to provide stiffer response and more support.

Smaller Recurve voids in the front of the midsole creates both spring and flexibility.

DEFINED BY SIMULATION

The Recurve pattern works through two modes. When initially stepping on the pattern, the curvature acts like a spring, deforming with little effort. As pressure is increased during a run, the pattern self-reinforces, creating a stiffer, supportive ride. The behavior of the pattern has been forged through continuous simulation, prototyping and iteration.



PUMA INNOVATION – A CULTURE OF FIRSTS