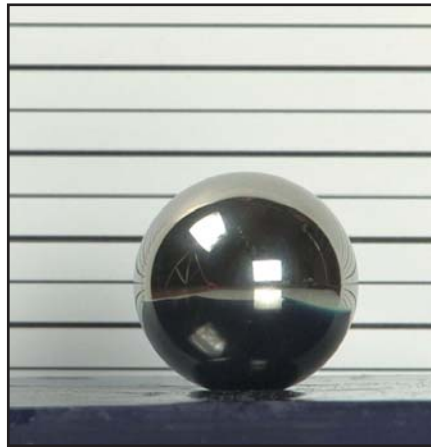


Shock & Contact Stress Protection

In response to requests from our extreme sport shoe clients, we've developed a dilatant gel material, Gpact II™, that "gives" comfortably and compresses slightly under low stress, but becomes firm, tight, and supportive at the moment of high impact. This effect is known as shear thickening, where the material's viscosity increases as shear forces increase.

This polyester-based gel is more environmentally-friendly than PVC-based materials.

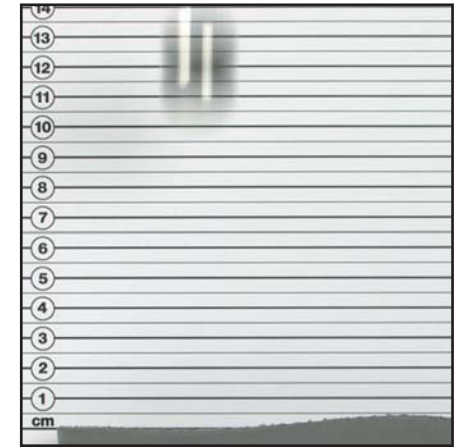
Dilatants are based on particles surrounded by liquid (in this case a gel). Under slow movement or low shear forces, the liquid moves easily around the particles as the material is distorted. But under higher-energy shear forces, such as an impact, the liquid cannot move quickly enough around the particles and friction is increased. The faster the shear or impact, the greater the friction and thus higher viscosity.



Gpact II 8mm thick



Polyurethane Insole 1cm thick



Polyurethane Insole w/Gel 1cm thick

The above video stills above show the relative rebound absorption of different materials. The steel ball is dropped from a set height.

A major benefit of utilizing a dilatant material in shoes is a reduced need for multiple material layers, i.e. separate EVA foam and gel pads. In many shoes, foam midsole components are used to cushion heel strikes during normal wear, such as walking. In sports activities, impacts from jumping and sudden stops/turns can expose the feet to loading as high as 17-18 times the athlete's body weight. Foam pads simply do not hold up well to these extreme forces.

Dilatant Gpact II offers cushioning during normal wear by remaining soft and highly pliable. When high-impact forces are applied, though, the dilatant material very rapidly stiffens, preventing bottom-out and spreading the impact forces over a larger area.

For athletes, nothing beats the ability to "feel" the surface and assess the connection with regards to traction or lack thereof. Having a thinner, single layer of material in the midsole brings the feet much more tactile feel, providing more control and better performance for the athlete.



[Watch the ball-drop video](#) 

Click text above to start video. Quicktime required.