
Temp-regulating Graphene and Dyneema Trail Shoe Sprints through Winter

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Graphene has worked its way into running shoes before, but Canadian startup Norda uses it in a more advanced way in its all-new 001 G+ Spike trail running shoe.

The shoe's graphene waterproof/breathable membrane keeps feet dry and also regulates temperature, allowing runners to stride comfortably through snow, slush and icy puddles. Combine that with ultralight, near-indestructible Dyneema up top and carbide spikes down low, and you have a running shoe that's built to rack up serious mileage through the heart of the coldest, harshest winters.

Yet another example of a latent business idea driven to fruition by the life-disrupting, time-freeing CIVID-19 pandemic, [Norda](#) was founded in 2020 by husband and wife team Willa and Nick Martire, lifelong runners and footwear industry veterans. Following a dream of developing the ultimate, no-compromise technical trail-running shoe, they worked with athletes, materials experts, suppliers and manufacturers from around the world, eventually identifying the exact balance of breathability, cushion, fit, grip, weight and sustainability that met their precise definition of "ultimate," testing prototypes on the oft-cold, wet trails of southeastern Quebec. Norda launched its first shoe, the 001, this (Northern Hemisphere) summer and is now ready to outfit runners for winter 2021/22.

A close relative of the 001, the 001 G+ Spike might just be the most technical trail running shoe we've ever come across, combining some of the world's buzziest wonder-materials into a single platform. Norda claims that it's the world's first shoe lined with a G+ graphene membrane, delivering not only 10K/10K waterproof/breathable weather protection but also temperature regulation via inherent thermal conductivity, so the runner's feet stay warm and dry, even when sprinting exclusively through wet, frozen or near-freezing terrain.



The 001 G+ Spike features a single-piece Dyneema upper and a chunky, spiked outsole.

The G+ membrane alone makes the Spike a notable advance in the running shoe market, but Norda doesn't stop there. It houses that membrane within the seamless, single-piece bio-based Dyneema upper it launched on the 001, saving weight without sacrificing an iota of toughness or abrasion resistance. Dyneema is the go-to fabric for no-expenses-spared gear that needs to be both ultralight and tough as nails, from tents, to apparel ... to bulletproof whiteboards. Dyneema also features in the laces, adding integrity-boosting strength and foot-hugging stretch.

Below all that uber-material goodness, the sole is still rubber. Norda previously teamed with Vibram to formulate a firm-gripping sole for the ever-varying terrain of trail running, and to further enhance that grip for all-out winter slickness, it adds 20 carbide-tipped steel spikes to put the "spike" in G+ Spike. That means wearers won't want to forget to pop these runners off before stepping onto their hardwood floor, but more importantly, it means they'll enjoy crunchy, full-spike bite when running up the type of ice-coated trail that would otherwise send them flailing back down the mountain.

All that attention to detail and materials results in a shoe that weighs under 10 ounces (283 g), complete with waterproofing and traction spikes. Norda lists the men's version (size US8.5) at 9.5 oz (268 g) with standard TPU insole, down to 8.7 oz (247 g) with OrthoLite insole, and women's (size US8) at 8.2 to 7.4 oz (232 to 211 g) with the same respective insoles.

Nothing about outdoor gear with buzzwords like "Dyneema," "lightweight" and "graphene" in the description ever comes cheap, and the 001 G+ Spike shoes are definitely no exception to that rule. At US\$335, they're some of the most expensive trail running shoes you can buy. Of course, "low price" was never among the mission-statement attributes for which Norda aims.

Read the [original article](#) on New Atlas.