



THE PERFECT SHOE FOR **HYROX** - A COMPLETE ANALYSIS





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WHO ARE WE?

WE ARE A WORLD LEADING COACHING TEAM COMPRISING OF DR'S, SPORTS SCIENTISTS, NUTRITIONISTS, REHAB INSTRUCTORS AND DATA ANALYSTS. CITED WITH REVOLUTIONISING THE WAY THE MILITARY APPROACHES PHYSICAL TRAINING WE HAVE 60+ YEARS EXPERIENCE IN THE MILITARY AND 50+ YEARS WORKING AT THE TOP LEVEL OF ELITE SPORT.

BETWEEN THE TEAM WE HAVE A PHD, 3 POSTGRAD DEGREES (2 ONGOING), 8 BSC'S, 30+ PEER REVIEWED PUBLICATIONS AND OVER 200 CITATIONS.

THE TEAM HAVE PLAYED AND/OR WORKED AT THE HIGHEST LEVEL OF ELITE SPORT, INSTRUCTED AND LED THE PHYSICAL DEVELOPMENT AT PARACHUTE REGIMENT DEPOT, COMMANDO TRAINING CENTRE, ROYAL MILITARY ACADEMY, SANDHURST, AFC HARROGATE, HEADLEY COURT AND COUNTLESS OTHER UNITS.

THE TEAM HAS COACHED MULTIPLE WORLD CHAMPIONS AND THE TEAM ITSELF HOLDS WORLD RECORDS, MULTIPLE PODIUMS AT IRONMAN, RUNNING AND HYROX EVENTS AS WELL AS PASSING SOME OF THE UK'S MOST ARDUOUS MILITARY COURSES.





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THE PHYSICS OF PROPULSION

Carbon-plated shoes boost running economy, right? But here's the kicker: they're not a magic fix. Your strength dictates how much bang you get for your buck.

How They Work (Short & Sweet)

- **Ground Reaction Force (GRF):**
 - Foot hits ground, force goes back up.
 - Stronger you are, bigger the force.
 - Carbon plate loves big forces, stores more energy.
 - Weak runners produce small GRF, and the carbon plate does very little.
- **Energy Storage:**
 - Plate bends, stores energy like a spring.
 - Big force = more bend = more energy.
 - Weak runner = little force = little bend = little energy return.
- **Leverage:**
 - Plate extends your foot's leverage.
 - More leverage = more power.
 - But you need to be strong to use it.

Why Strength Matters (The Gist):

- **Maxing Energy Return:**
 - Plate needs your oomph to work.
 - Stronger legs = bigger push = bigger return.
 - Weak runner = small push = small return.
- **Controlling the Boost:**
 - Plate gives a powerful kick.
 - Strong core keeps you stable.
 - Weak core = wobbly running.
- **Keeping Good Form:**
 - Plate changes how you run.
 - Strong muscles stop you falling apart.
 - Weak Muscles = poor form, and potential injury.
- **Adapting:**
 - The plate changes how your foot connects to the ground.
 - You need strength to adapt.



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THE STRENGTH - PERFORMANCE LINK

Right, let's be brutally honest... You've shelled out for those carbon-plated super shoes, expecting them to magically shave minutes off your time. But here's the cold, hard truth: they're not a cheat code. They're a high-performance instrument, and like any instrument, they demand a skilled player. You can't just slap them on and expect miracles. You need the raw, unadulterated strength to make them sing. To make them truly unleash their potential, to turn that carbon fibre into pure repeatable speed. Without it, you're just wearing expensive paperweights. Think of it like putting a Formula 1 engine in a Reliant Robin; you'll have the power, but no way to control it. So, let's dive into why strength isn't just a 'nice to have'—it's the damn prerequisite:

- **Generate High Ground Reaction Forces: Fuel the Fire**
 - Think of the carbon plate as a turbocharger. It needs fuel—force. The harder you stomp, the more energy it stores, and the bigger the kickback.
 - Weaklings? They're running on fumes. Tiny ground forces mean a puny plate flex, and a pathetic energy return.
 - Basically, if you can't load the spring, you won't get the bounce.
- **Control and Utilize the Rebound: Tame the Beast**
 - That carbon plate's recoil? It's like a rocket boost. But rockets need steering.
 - Strong athletes direct that force, turning it into pure forward speed.
 - Weaklings? They're getting bucked around, wasting energy, and risking a faceplant.
 - Think of it like this, if you can't control the power, you will just spin your wheels.
- **Maintain Proper Form: Master the Mechanics**
 - Carbon plates change the game. They tweak your running style, demanding precision.
 - Solid core and leg strength? You'll adapt, keep your form, and fly.
 - Weak core and legs? Your form will crumble, and you'll be fighting the shoe, not the clock.
 - This is not a passive process, the runner must actively engage, and adapt to the new mechanics.



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RESEARCH, IMPLICATIONS AND CONSIDERATIONS

Hyrox is a new sport and therefore research on it is hard to come by. But carbons have lots of studies on it across other sports. With everybody looking at carbons for that next 1% - Lets use it and see what the research is saying:

Research and Implications:

- Studies have shown that carbon-plated shoes can significantly improve running economy in elite runners. (Hoogkamer, Kipp, Frank, & Kram, 2018). However, the magnitude of these improvements may be less pronounced in less experienced or weaker runners.
- The effectiveness of carbon plates is also influenced by running speed. Faster runners generate higher ground reaction forces, maximizing the plate's energy return. (Willems, Schepens, & Cavagna, 1995).

Hyrox Considerations:

The research is all on running. Whilst it plays a huge role in success and better times, its not 100% of the sport and so we need a shoe that can cover it all. In the context of Hyrox, where functional exercises are interspersed with running, strength becomes even more critical. Athletes must be able to maintain running efficiency while transitioning between strength-based stations. Carbon-plated shoes can provide a performance edge, but only if the athlete possesses the underlying strength to utilise them effectively in the run, whilst not compromising their stability and grip on the stations

THE CARBON CONTENDERS

Hyrox, the fitness race that blends running with functional workout stations, demands a shoe that can handle it all. Speed, stability, grip, and comfort are paramount. And when it comes to speed, carbon-plated running shoes are the undisputed champions. But which one is best for the unique challenges of Hyrox?

The Carbon Contenders: A Weighty Matter:

We'll be assessing a range of carbon-plated titans, focusing on their suitability for Hyrox's demands, with a keen eye on their weight and performance. All weights are approximate and based on a men's UK size 9 unless otherwise stated.

1. Nike Vapourfly 4

- **Price:** £239
- **Weight:** Approx. 190-196 grams (approx. 6.7-6.9 ounces)
- **Support:** Minimal, designed for pure speed.
- **Stability:** Moderate, less stable on uneven surfaces.
- **Grip:** Excellent on dry surfaces, less reliable in wet conditions.
- **Turning Ability:** Agile, but less stable during sharp turns.
- **Hyrox Notes:** The Vapourfly 4 is a speed demon, but its lack of stability and support might be a liability during loaded carries and lunges. Its lightweight design prioritizes speed, but sacrifices stability. Empirical research has shown carbon plated shoes improve running economy. (Hoogkamer, Kipp, Frank, & Kram, 2018). Further research has shown improvements in running economy due to the carbon plate and foam combination (Ortega, Healey, & Kram, 2019). However, this research is based on straight line running, and Hyrox has far more complex movements.



THE CARBON CONTENDERS

2. Nike Alphafly 3

- Price: £289
- Weight: Approx. 205-210 grams (approx. 7.2-7.4 ounces)
- Support: Moderate, more supportive than the Vapourfly 4.
- Stability: Improved stability due to wider base.
- Grip: Excellent on dry surfaces.
- Turning Ability: Good, but still less stable than non-carbon shoes.
- Hyrox Notes: The Alphafly 3 offers more support and stability, making it a better Hyrox option than the Vapourfly 4, but the price tag is a major consideration.



3. Nike Zoom Fly 6 (Carbon)

- Price: £154
- Weight: Approx. 278 grams (approx. 9.8 ounces)
- Support: Good, more supportive than the Vapourfly 4 and Alphafly 3.
- Stability: Good, stable for various surfaces.
- Grip: Durable and reliable.
- Turning Ability: Good, stable during turns.
- Hyrox Notes: The Zoom Fly 6 (Carbon) is a durable and stable option, offering a good balance of speed and support, making it a good choice for Hyrox. The heavier weight is a trade off for increased stability.



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4. Puma Fast-FWD NITRO™ Elite Running Shoes Men

- Price: £210
- Weight: Approx. 210 grams (approx. 7.4 ounces)
- Support: Good, well-cushioned.
- Stability: Good, stable for varied terrain.
- Grip: PumaGrip outsole provides excellent traction.
- Turning Ability: Responsive and agile.
- Hyrox Notes: Puma has made a strong entry into the carbon race. The Fast-FWD NITRO™ Elite Running Shoes Men provide a responsive ride with excellent grip, making it a strong contender for Hyrox.



5. Saucony Endorphin Pro 4

- Price: £229
- Weight: Approx. 212 grams (approx. 7.5 ounces)
- Support: Good, with enhanced cushioning and a more secure fit.
- Stability: Improved stability due to a wider platform and updated geometry.
- Grip: Excellent PWRTRAC outsole, with enhanced durability and traction.
- Turning Ability: Highly agile and responsive, with improved cornering capabilities.
- Hyrox Notes: The Endorphin Pro 4 offers a faster, more stable, and responsive ride and enhanced grip make it an even more compelling choice for the varied demands of Hyrox.



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. 6. Adidas Adizero Adios Pro 4

- Price: £220
- Weight: Approx. 226 grams (approx. 8.0 ounces)
- Support: Enhanced cushioning and a more secure, locked-down fit.
- Stability: Improved stability with a wider platform and refined midsole
- Grip: Continental rubber outsole, optimised for enhanced traction
- Turning Ability: Highly responsive and agile, with improved cornering and quick transitions.
- Hyrox Notes: The Adizero Adios Pro 4 has stability, comfort, and grip, making it an excellent option for the varied demands of Hyrox. The refined design aims to provide a more efficient and responsive ride.



7. Adidas Adizero Prime X Strung 2.0

- Price: £250
- Weight: Approx. 306 grams (approximately 10.8 ounces)
- Support: Maximum cushioning for longer distances.
- Stability: Enhanced stability features to manage the high stack height.
- Grip: Continental rubber outsole provides excellent traction.
- Turning Ability: High stack height requires careful manoeuvring.
- Hyrox Notes: The Prime X Strung 2.0 offers comfort, but the higher weight compromises speed and stack height presents challenges during the functional exercises.



THE CARBON CONTENDERS

8. New Balance FuelCell SuperComp version 4

- Price: £259
- Support: Good, well-cushioned.
- Stability: Good, stable for various surfaces.
- Grip: Good, reliable traction.
- Turning Ability: Responsive and agile.
- Hyrox Notes: New Balance has stepped up its game with the FuelCell SuperComp version 4, offering a comfortable and fast ride, suitable for Hyrox.



9. Nike Streakfly 2: The Hyrox Champion

- Price: £140+
- Weight: Approx. 185 grams (approx 6.5 ounces)
- Support: Good, surprisingly supportive for a lightweight shoe.
- Stability: Excellent, very stable for a carbon plated shoe.
- Grip: Excellent, designed for road racing and varied surfaces.
- Turning Ability: Exceptionally agile and responsive.
- Hyrox Notes: The Nike Streakfly 2 strikes the perfect balance for Hyrox. It's lightweight for speed, yet surprisingly stable and supportive for functional movements. Its excellent grip and agility make it ideal for the varied challenges of Hyrox. The price point is also a significant advantage.





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CONCLUSION

We have dissected the carbon-plated titans, weighed their pros and cons, and laid bare the physics behind their propulsion. One truth stands tall: carbon shoes are performance amplifiers, not magic wands. If you're weak, they'll expose your flaws, not mask them.

The Nike Streakfly 2? It's the undisputed Hyrox champion. It's the rare beast that blends blistering speed with the stability and agility needed to conquer those functional stations. It's the shoe that, frankly, we trust so damn much, I've kitted out every single coach heading to the Hyrox World Championships in Chicago with a pair. That's how much we believe in them.

But here's the kicker: even the Streakfly 2 won't save you if you're built like a wet noodle.

Strength isn't optional; it's the bedrock. Prioritise it. You have to get specific in training in order to maximise your strength and to build that power. Then, and only then, will you truly unlock the potential of these carbon-plated weapons.

Choose your shoes wisely, get ruthless and specific with your training, and find a way to win.

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- Running Shoe Reviews and Comparisons: Various online running shoe review websites and forums.

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