

Olympics

Olympians suit up in high-tech apparel to shave seconds

By ANICK JESDANUN
Associated Press

NEW YORK — When seconds count, the right clothing matters.

For the Rio Olympics, Nike used 3-D printing technology to develop small silicone protrusions for redirecting air flow around the runner. Body scanners helped Adidas design suits to keep swimmers in ideal form. Swiss cycling specialist Assos turned to wind tunnels to craft custom, form-fitting suits for the U.S. cycling team.

Innovations in suits and shoes have sped up, thanks to advancements in how clothing is designed and tested — all as manufacturers get creative in working around rules enacted to prevent the apparel equivalent of doping.

“We make sure we stay inside those rules, but we will get to the very edge of them if we can,” said Adam Clement, senior creative director for team sports at Under Armour. “Our goal is to innovate in a way that ultimately makes the Olympic rules change. We’ll adjust, but we’ll feel proud of that accomplishment.”

WHY IT MATTERS: Clothing needs to be form-fitting to minimize air resistance, especially for speed events in cycling, swimming and track.

“Four seconds in four kilometers is (the difference between) first and eighth place,” said Jim Miller, vice president of athletics with USA Cycling.

But the wrong materials or designs could mean discomfort and unnecessary weight — counteracting the gains from drag reduction.

Even when speed isn’t a factor, clothing promises to reduce irritations such as



This undated photo provided by Nike shows the company’s Olympic sprint tape. Nike makes the spikes as a tape for runners to use on their arms and legs.

sweat and heat — crucial in a hot climate like Rio de Janeiro, Brazil, where the Summer Olympics open on Friday.

PREVENTING PROBLEMS: Clothing alone won’t make up for years of training, good coaching and the right body mechanics, but the wrong kind can hurt.

“You’re not going to catch magic on race day from magic shoes,” U.S. marathoner Desiree Linden said in an interview. “But if I train really hard and I get a blister or don’t step on my foot right, the race doesn’t matter anymore.”

A late introduction of Under Armour’s high-tech suit for speedskating got some of the blame for the U.S. team’s dismal performance two years ago in Sochi, Russia. UA said it is already testing suits for 2018 and will try to get them to competitors sooner, with more customization for

individual body types.

For Rio, U.S. cyclists got their Assos suits just two weeks ago and will have the option of wearing their regular outfits if they don’t like the fit.

THE OUTFITS: Athletes typically get clothing and shoes as part of brand-sponsorship deals.

Running specialist Brooks turned to Linden to help design her Hyperion shoes. The shoe fabric eliminates seams to reduce the risk of blisters, while rubber rings on the bottom boost traction in slippery terrains and serve as barriers to contain and propel energy back up, according to the company.

“It feels like you do get a spring,” Linden said. “There’s no wasted energy. It’s going right back into you. It feels fast.”

Brooks started selling the shoes in June, though Linden and other Olympians will get extra laser perforations in

their shoes for ventilation in Rio’s heat.

Under Armour uniforms for the Canadian rugby and the Swiss and Dutch beach volleyball teams borrow NASA spacesuit technology to reduce body temperature. The insides have crystal-pattern sheets to absorb heat from the body.

As for Nike’s air-resistance protrusions, the company is embedding them in track suits for about two dozen teams, including the U.S., Brazil, China and Germany. Nike will also make the protrusions available as a tape for runners to stick on their arms and legs.

THE BOUNDARIES: Swimming has among the toughest guidelines after Speedo’s suits propelled Michael Phelps and other swimmers to medals and records at the 2008 Olympics. Their full-body suits — which are no longer



This undated photo provided by New Balance shows U.S. sprinter Trayvon Bromell adjusting his shoes.

permitted — were developed with NASA to boost buoyancy and reduce drag.

Clothing makers can still innovate; they just have to be creative. Michelle Miller, Nike’s apparel concept director, said figuring out how “is one of my favorite parts of the design process.”

Adidas’ Adizero XVI swimsuits for Britain’s Chris Walker-Hebborn and other swimmers have elastic-like bands meant to keep bodies in streamlined positions. That minimizes drag and propels swimmers in the pool. Because the rules allow Adidas to place the bands only over seams where pieces of fabric meet, Adidas moved the seams over to where it wanted the bands to be.

Now that it had bands, Adidas also took the unusual step of designing a model just for the breaststroke to account for the way a swimmer’s legs move outward in the frog kick, rather than up and down in the more traditional flutter kick.

IN THE LABS: Omar Visentin, chief operating officer and former research chief at Assos, said clothing manufacturers now have more sophisticated ways to tests fabrics and the way they are

cut and measure minute differences in performance.

Other companies even use computer modeling to design that perfect suit with fewer prototypes, said Ajoy Sarkar, a professor at the Fashion Institute of Technology.

For the Vazee Sigma track shoes that U.S. sprinter Trayvon Bromell will wear, New Balance turned to 3-D printing technology to test multiple configurations to improve traction and energy transfer.

Nike also used 3-D printing and wind tunnels to improve its air-resistance protrusions, which worked only for sprints during the 2012 Olympics. Miller said prototypes from 3-D printing allowed Nike to find a shape that works for longer distances, too.

Adidas designed its Adizero MD mid-distance shoes to account for curvatures in the track, rather than just the straightaway portions of races. It tested various combinations of stiffness and thinness to keep runners like Kenya’s David Rudisha stabilized so they don’t slow down at curves.

Adidas’ director of future, Deborah Yeomans, said engineers are already at work on designs for 10 years from now — when expectations will be even higher.

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