

# 2013 WETSUIT

## PERFORMANCE TEST

**THE BENEFITS** of triathlon wetsuits have largely remained unquantified—until now. With help from one of the world's leading sports science and physiology experts, *Triathlete* conducted testing on a variety of wetsuits to determine the actual gains a swimmer experiences by wearing specific suits. This type of data, previously reserved exclusively for Olympic swimmers, arms every wetsuit buyer with tangible information to make an informed choice about not just comfort, but performance as well. It also helps decipher actual speed-boosting features from marketing jargon by removing the mystery that surrounds most wetsuit technology. Here's how eight wetsuits representing the cost spectrum measured up in the lab.

### THE TEST

Genadijus Sokolovas, Ph.D., USA Swimming's director of sports science and physiology from 2000 to 2008, designed the Swim Power System to measure the force and speed a swimmer creates at every point during a stroke with the goal of helping athletes become more efficient. Sokolovas has used it to test more than 45 Olympic gold medalists. In addition to examining technique, he created this protocol to determine how effective a suit (bathing suit, swim skin, wetsuit) is for a swimmer, and it was used to select race suits for American Olympians prior to the Beijing Games. The steps:

- ▶ Tester swims a warm-up without a suit.
- ▶ Tester swims six 25's of increasing intensity—from easy to sprint—in each wetsuit.
- ▶ A buoy is held in place between both ankles to eliminate the

kick as a variable.

- ▶ Sokolovas records swimmer velocity and distance per stroke while the swimmer is driven only by his or her stroke (the swimmer stopped at the flags, removing the factor of the wall push-off).
- ▶ Results are reported as difference in distance per stroke (DPS) when swimming in a wetsuit compared to swimming without a suit.

By connecting the data points at various swim speeds, Sokolovas creates a chart describing the swimmer's distance per stroke—his or her efficiency—in each suit. The further a swimmer travels with each stroke at each speed, the more effective the suit.

The swimmer's efficiency at race pace and overall average efficiency at each of the six speeds tested is reported for every suit.

**DATA SPEAK**  
"DPS: +XX%" indicates the extra distance per stroke compared to swimming without a wetsuit

#### TEST LIMITATIONS

- ▶ Different wetsuit features help swimmers in different ways, meaning that these data, while relevant to everyone, only apply directly to the athletes tested, one who's a power swimmer and one who's a balanced swimmer. There's no guarantee these results will be duplicated in any other swimmer.
- ▶ The subjects may not have swum with the same technical efficiency during every test, regardless of the suit. Although they were both in mid-season fitness, their strokes could have changed during the course of the test as they warmed up or started to fatigue.
- ▶ Kicking wasn't a part of the test protocol. While this helps to improve repeatability, it might put suits with less lower-body lift at a disadvantage. Fatigue was also not considered. The strain of swimming in a less flexible suit may have an effect of efficiency late in the swim.
- ▶ Fatigue created by the suit also wasn't considered. An inflexible wetsuit may wear a swimmer out and decrease efficiency in the late stages of a race, but this test was conducted with ample rest between trials.

**Xterra Vendetta**  
\$800, [Xterrawetsuits.com](http://Xterrawetsuits.com)  
*Efficiency testing:* This suit tested in the top third for both athletes, providing comparatively similar benefit for both athletes despite the big differences in their stroke type. Both benefited tremendously at slower speeds, but less so at speeds above race pace.

*Fit & flexibility:* Incredible flexibility is the hallmark of Xterra's Vendetta. Testers agreed that it conformed to their every movement, saying, "It felt molded to my body" and "there was no resistance at all. At times I forgot I was wearing a wetsuit." This extensive flexibility throughout the suit allows it to comfortably wrap around many different body types. Despite its free-moving feel, neither tester had an issue with water leaking into the suit or excess material at the armpits or shoulders. The Vendetta stood out as one of the two most flexible full-sleeve suits in the test.

**Balanced swimmer**  
Race pace DPS: +15%  
Average DPS: +11%

**Power swimmer**  
Race pace DPS: +17%  
Average DPS: +17%

**Orca Predator**  
\$1,000, [Orca.com](http://Orca.com)  
*Efficiency testing:* While the testers named it the most comfortable full suit, both swimmer types benefited modestly from wearing it.

*Fit & flexibility:* Overall comfort, not just flexibility, separates the Predator from the rest of the full-sleeve suits. While all the other suits either flexed freely or provided a little extra spring in the stroke, the Predator moved without restriction and injected a small power boost into every pull. Testers reported zero rib constriction, saying, "No area was too tight." And despite having a low collar that didn't chafe the testers, no excess water entered the suit.

**Balanced swimmer**  
Race pace DPS: +1%  
Average DPS: +2%

**Power swimmer**  
Race pace DPS: +9%  
Average DPS: +9%

**GEAR LAB**  
MOST COMFORTABLE

**GEAR LAB**  
FASTEST FOR BALANCED SWIMMERS

### Blueseventy Fusion

\$295, [Blueseventy.com](http://Blueseventy.com)

**Efficiency testing:** While this suit was effective for both testers, the swimmer with a balanced body position in the water benefited more from this suit. It was clearly the fastest, most efficient choice for her.

**Fit & flexibility:** The Fusion felt tighter against the testers' bodies than some of the other suits yet didn't squeeze or constrict the ribcage. While testers found it to be a little less comfortable out of the water, that additional tension translated into forward motion in the water. One tester said, "I felt like it propelled me a little more. It gave my stroke more oomph, more snap." The slightly less flexible body connected the shoulders to the hips, allowing the testers to really drive into each stroke with their entire bodies, not just their arms.

#### Balanced swimmer

Race pace DPS: **+15%**  
Average DPS: **+18%**

#### Power swimmer

Race pace DPS: **+17%**  
Average DPS: **+16%**

### 2XU A:1

\$300, [2xu.com](http://2xu.com)

**Efficiency testing:** The powerful swimmer got a substantial boost (although a little less than the other full-sleeves) from this suit, but it was less impactful for the balanced swimmer.

**Fit & flexibility:** One tester loved this suit so much he called it more comfortable than one costing more than twice as much, praising its "natural feel in the water" and "lack of resistance during the reach and stroke finish." The other tester, however, felt restricted while wearing it. The torso and ribs are shaped for an average-to-narrow body and the arms are quite long. Very little water penetrated the neck opening, and it felt snug against both testers.

#### Balanced swimmer

Race pace DPS: **+3%**  
Average DPS: **+6%**

#### Power swimmer

Race pace DPS: **+15%**  
Average DPS: **+15%**

## THE TEST TEAM

The effectiveness of a wetsuit depends on the swimmer. A person capable of keeping his or her hips and legs at the surface without assistance, for example, may need less lower-body buoyancy than a swimmer who sinks. To account for these personal differences, two distinctly different swimmers were selected to test the suits.

#### Power swimmer:

He started swimming in June 2009 as a short-distance triathlete. He had no prior swimming experience. His body position in the water isn't great (read: he's a leg dragger), but he is also very strong and fit.

#### PRs

500 yards: **6:43**  
1,500m Olympic-distance swim: **21:30**

#### Balanced swimmer:

She began swimming at age 12 and raced in high school. She then competed for the University of Colorado's swim and water polo clubs before becoming a triathlete. She floats well, but lacks the upper-body strength of the other tester.

#### PRs

500 yards: **5:50**  
1,500m Olympic-distance swim: **21:50**

**Tyr Category 3****\$460, [Tyr.com](http://Tyr.com)**

*Efficiency testing:* The brawny swimmer with poorer body position in the water was fastest in this suit—and it worked well for the swimmer with a more horizontal position, too. This wetsuit was an all-around standout in the speed testing.

*Fit & flexibility:* Like the Blueseventy Reaction, this mid-level suit thrives on precise tension. It doesn't conform to the swimmer like the Orca or Xterra suits, but instead compresses the body into a more compact shape. Testers observed that the Category 3 fits tighter than many of the suits reviewed, but that constriction allowed them to create additional propulsion. "The material felt more restrictive, but the extra snap it added to my stroke was worth it—the suit felt fast," said one reviewer. Despite benefiting from the total body connection this suit creates, both testers found the Cat. 3 to be less subjectively comfortable than several of the other suits due to its semi-constrictive mid-section. Neither tester rated it especially high for overall comfort, but the results of the efficiency testing show it's extremely fast for many types of swimmer.

**Balanced swimmer**Race pace DPS: **+17%**Average DPS: **+14%****Power swimmer**Race pace DPS: **+22%**Average DPS: **+22%****De Soto First Wave****\$600, [Desotosport.com](http://Desotosport.com)**

*Efficiency testing:* The power swimmer's efficiency improved substantially while wearing this suit, but he benefited even more from six of the others.

*Fit & flexibility:* While all the other suits in this review are one-piece, this unique wetsuit uses a long-john covered with a wetsuit top. Its two-piece construction permits the upper body to move and slide without being anchored to the rest of the suit. Our tester said this unique design gave the First Wave "the most arm freedom of any of the suits with sleeves." Every part of the stroke feels similar to wearing no suit at all. "The recovery phase was easy and free," he said. "I extended my arm a little farther with ease," although the top slid up slightly. Since the top isn't held in place by the hips, finding the right size for your physique is key. Weight alone isn't enough to get the fit right.

**Balanced swimmer**

*Due to a sizing issue, this swimmer's results were invalid.*

**Power swimmer**Race pace DPS: **+12%**Average DPS: **+12%**



### Zoot Z-Force 2.0 Sleeveless

\$250, [Zootsports.com](http://Zootsports.com)

*Efficiency testing:* Despite the sleeveless design, both testers got a substantial boost from the Z-Force 2.0. It was just as effective as many of the full-sleeve options.

*Fit & flexibility:* While all sleeveless suits offer nearly uninhibited arm motion, not every one makes a solid yet comfortable connection with the swimmer's body. But the Z-Force 2.0 did exactly that. "Arm openings were tight and almost no water leaked in while swimming," reported one tester. This arm seal is key to the efficiency of a sleeveless suit—otherwise water can flush through the suit, making the swimmer less buoyant and colder. By sealing effectively without pinching, it earned high praise as one tester's pick as the most comfortable suit in the review. Despite loving the feel, the tester did notice the difference in lift, saying, "In regard to buoyancy and pull, the sleeved suits were better."

**GEAR LAB**  
**FASTEST SLEEVELESS**

#### Balanced swimmer

Race pace DPS: +11%  
Average DPS: +12%

#### Power swimmer

Race pace DPS: +19%  
Average DPS: +19%

### Aqua Sphere Pursuit SL

\$200, [Aquasphereswim.com](http://Aquasphereswim.com)

*Efficiency testing:* The swimmer with poorer hip position was very efficient in this suit, which beat out four of the full-sleeve options. The naturally efficient swimmer, however, saw a modest improvement to her distance per stroke.

*Fit & flexibility:* Medium-sized bodies are the best match for this sleeveless suit. Its arm openings felt "equally tight" to the Zoot sleeveless, but one tester found the Pursuit to be more comfortable because the cuff is wider. Like most sleeveless suits, this one lacks any spring or extra propulsion. While testers didn't feel an added boost from the suit, both found it to be exceptionally comfortable in the water. For pure comfort and a natural swim stroke, this suit is hard to beat.

#### Balanced swimmer

Race pace DPS: +6%  
Average DPS: +4%

#### Power swimmer

Race pace DPS: +19%  
Average DPS: +19%



Go to [Triathlete.com/wetsuittest](http://Triathlete.com/wetsuittest) to watch a video of the test and view all the data.