



THE TRUTH ABOUT BODIMAX

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A3 PERFORMANCE™

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INTRODUCTION

BODIMAX Sleeves, developed by A3 Performance, are the newest, patent-pending innovation in the sport of competitive swimming. The BODIMAX Sleeves are the first-ever aquatic compressionwear; they are compression sleeves designed specifically for in-water training. The power of this innovation, though, is in its technology; the BODIMAX Sleeves are built with textile technology that has penetrative power and is proven to heal and rejuvenate the human body. BODIMAX Technology is a Far Infrared (FIR) textile technology that has numerous healing properties and is woven into the BODIMAX Sleeves. This new technology, especially in sport, is the fabric technology of the future.



What is Far Infrared (FIR) Energy?

Far Infrared (FIR) is an invisible form of energy that has a wavelength above microwave but below visible light; “The FIR electromagnetic spectrum of wavelengths between 5.6 and 1000 μm is not visible to the human eye” [1]. FIR energy is completely natural; it is in the environment and comes directly from the sun. It is also understood to be the best natural energy source, “Among the total spectrum of solar rays coming from the sun, the Far Infrared Rays are the safest and most beneficial” [2].

FIR Energy Treatment & Therapy

The primary characteristic that makes FIR Energy so significant is its great, penetrative power, “FIR radiation can penetrate relatively deep into the human body, reaching as far as 4-7cm into the tissues, and is readily absorbed by biological materials” [1]. FIR energy rays are able to reach deep into the cells, inner tissues, nerves, glands, and organs beneath the skin. In doing so, FIR Energy is “absorbed very easily by the human body and helps in all aspects of bodily growth and development” [2].

FIR Energy rays have numerous, invaluable health benefits and are used in multiple forms of treatment and therapy. Far Infrared Treatment is used on a variety of ill or injured patients as it “stimulates cellular metabolism which increases the body’s regenerative ability and helps restore proper function of the nervous system. When any tissue in the body is exposed to FIR the body’s healing processes are activated” [2]. These healing processes are generally identified as expanding capillaries, improved circulation, and more efficient elimination of toxins from the bloodstream, “other beneficial effects may include assisting the regenerative ability of tissues, activating the immune system and enhancing the removal of cellular waste materials” [1].

FAR INFRARED ENERGY

The most significant ways that FIR therapy can improve human health are:

- Increasing oxygen levels in the blood
- Promoting regeneration, rapid healing, and recovery
- Rejuvenating skin and muscle tissue
- Reducing lipids in skin tissue
- Enhancing delivery of oxygen and nutrients to soft tissue, like muscles
- Enhancing metabolism
- Improving blood circulation
- Improving the function of the nervous system
- Relaxing muscles
- Removing accumulated toxins and acids by improving lymph circulation [1]

Far Infrared Energy in Textile

This is where BODIMAX Technology innovates. Far infrared fabrics are generally derived from traditional fabrics, but are functionalized by the incorporation of active FIR material. The functionalized FIR material is manufactured into the fabric and then into the garment.

The most important takeaway from FIR Energy in textiles is that “FIR textiles are powered by the wearer” [1]. Without the human body to interact with the textile, there is no benefit to the product. FIR textiles are latent energy sources that are activated when they are worn. Humans constantly radiate or emit energy, including FIR energy. Energy is transferred from the body and absorbed by the FIR material which “maintain their [wearer] temperature at sufficiently high levels and then emit FIR back to the body” [3]. The FIR emitting material also prevents the loss of FIR energy that would have escaped the body through normal clothing or lack of clothing. These FIR fabrics ensure that the thermo energy radiated by the body is absorbed and emitted back by the fabric as Far Infrared Rays, which then activate the body’s healing processes (see Figure 1).

FAR INFRARED ENGERY

In one study by Conrado and Munin, 42 women were tested to determine the effect of a garment made with FIR materials on the reduction of body measurements. The women were divided into two groups: active and placebo. Women in both groups wore their garments for eight hours a day for 30 days. The experiment resulted in a reduction in body measurements for the women in the active group. This is believed to be the result of increased microcirculation and peripheral blood flow, further promoting improved general health [3,4].

Other experiments have tested the impact of FIR textiles on the discomfort of menstruation, cellulite in the legs, chronic foot pain, and more. The benefits of FIR textile are numerous and the areas in which humans can benefit from FIR textile are never-ending. One area that has significant room for advancement when it comes to FIR materials is sport.

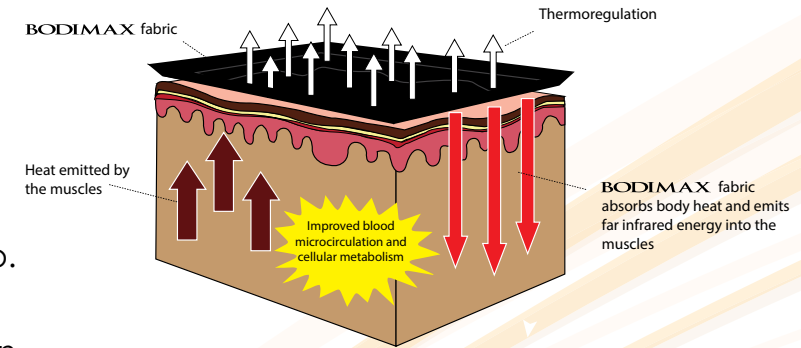
Far Infrared Energy in Sport

According to the sample study mentioned previously, FIR materials are powerful. People can reap major benefit from these textiles in their everyday life. One particular group of people that has a lot to gain from this advancement in technology is athletes.

Athletes are obviously not the only people who exercise regularly, but their physical activity tends to be more frequent and more intense than average, therefore, their bodies are often put through more physical stress. The demanding nature of their daily activity can cause a variety of aches, pains, and ailments including, but not limited to:

- Cramps
- Muscle soreness/tightness
- Muscle spasms
- Overheating
- Injury
- Fatigue/Exhaustion

Figure 1



The BODIMAX Sleeves are a functionalized FIR garment that absorb body heat, emit it back to the muscles as FIR energy, and thus activate the body's healing processes.

FAR INFRARED ENERGY

Many of these problems are by-products of lactic acid buildup in the muscles, which FIR fabrics can positively affect. FIR textiles can be a solution to, prevention of, or aid in a majority of these problems due to its healing properties, "FIR textiles can, in principle, maximize body heat and thereby prevent muscles from feeling over-worked, potentially improve muscle tone and mitigate soreness and muscle spasm while reducing the risk of injury" [1].

Tested and Proven

Other experiments have been conducted to prove the effectiveness of FIR textile in sport, athletes, and physical activity. One of these studies was commissioned at North Carolina State University (NCSU) in 2015 and tested the impact of the FIR fibers used in BODIMAX on subjects undergoing physical exercise [5]. This study was designed to replicate a prior study conducted at Politecnico di Torino, Istituto Centro Cardiologico Monzino, and Università di Genova in Italy in 2014.

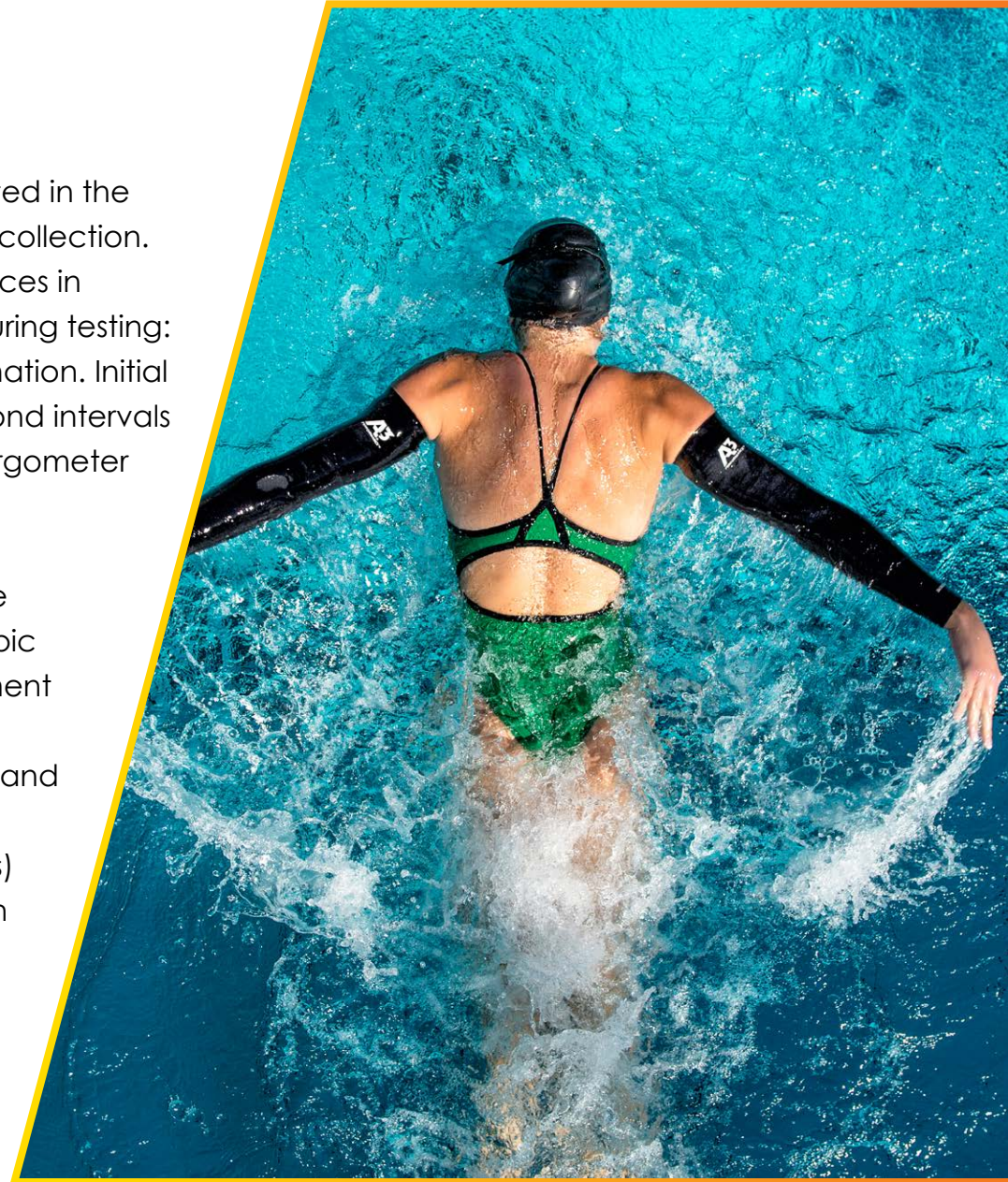
There were 10 volunteers who participated in this study. Participants completed two standard cycle ergometer cardiopulmonary exercise tests (CPET), a minimum of two days apart; one test was performed while wearing the functionalized (FIR) garment, and the other test was performed while wearing a matching, control (no FIR) garment. To limit possible subject bias, test subjects had no knowledge of which set of garments contained the functional fibers [5].



FAR INFRARED ENERGY

After putting on the garments for a particular trial, subjects rested in the test chamber for 60 minutes prior to instrumentation and data collection. The following data were collected to detect potential differences in physiological responses based on which garment was worn during testing: metabolic data, blood pressure, heart rate, and blood oxygenation. Initial metabolic data were collected at rest, then at regular 15-second intervals throughout the incremental workload increases of the cycle ergometer test, and immediately post-test.

The results of this study showed that the average length of time that test subjects could exercise before reaching their anaerobic thresholds (AT) was significantly longer when wearing the garment containing BODIMAX Technology. This is significant for athletes because postponement of reaching AT enhances endurance and performance during a workout. Additionally, this study proved that wearing a functionalized fabric (like the BODIMAX Sleeves) resulted in significantly smaller increases and less accumulation in blood lactate levels, which indicates enhanced metabolic waste removal during exercise [5].

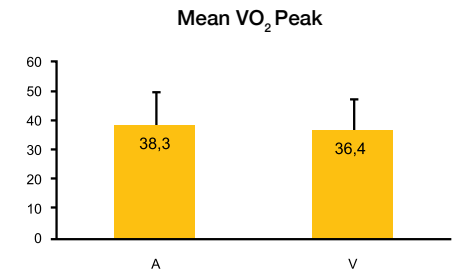
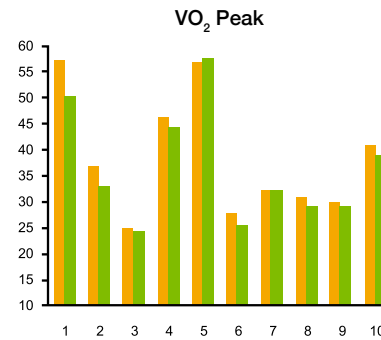


BODIMAX TECHNOLOGY

BODIMAX Technology is A3 Performance's unique FIR fabric development, produced specifically for BODIMAX Sleeves. The FIR fibers used in BODIMAX Technology were tested in the same format as the NCSU and Italian studies above, using standard cycle ergometer cardiopulmonary exercise tests and double-blind testing. The results were remarkable, indicating that the fibers used to develop BODIMAX Technology are proven to have the following effect on athletes:

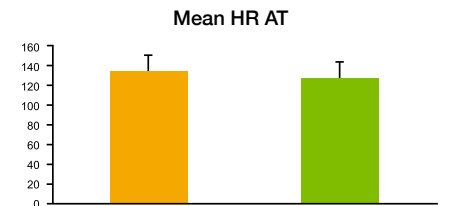
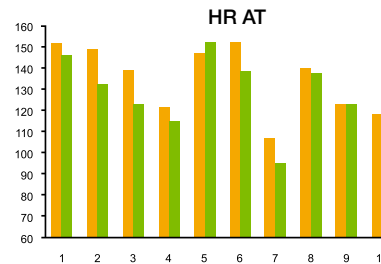
- **5% greater uptake (usage) of oxygen at peak**

- » Greater uptake of oxygen suggests a better peripheral transport of oxygen caused by interaction with the outfit with BODIMAX Technology in it.



- **6% greater output at Anaerobic Threshold**

- » A higher heart rate at the anaerobic threshold is bound to a greater exercise intensity at threshold wearing the functionalized outfit.



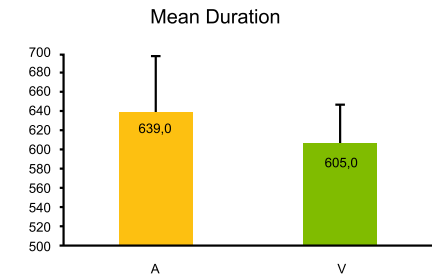
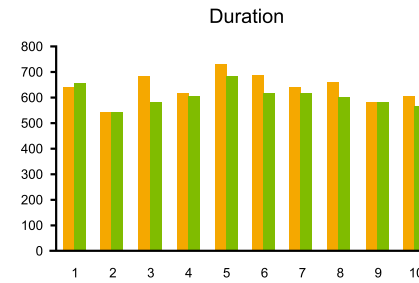
■ Functionalized Garment with BODIMAX Technology
■ Placebo Garment

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BODIMAX TECHNOLOGY

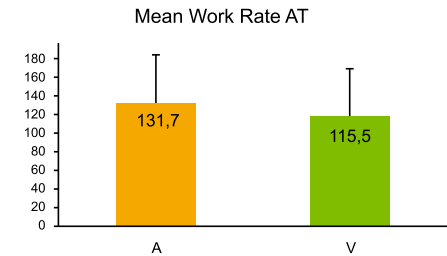
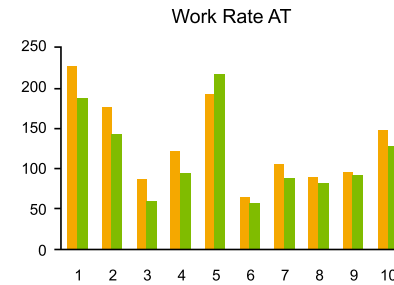
- **5.6% greater test duration, corresponding to a greater oxygen consumption**

» The greater test duration wearing the garment with BODIMAX Technology suggests a greater exercise capacity and this corresponds to the observed greater oxygen consumption.

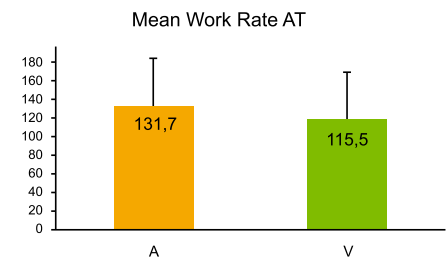
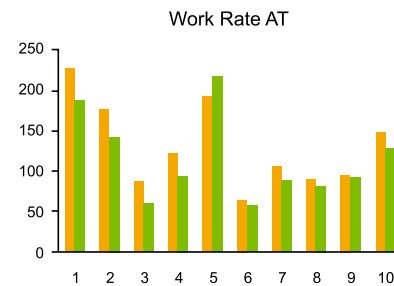


- **14% greater work rate at the Anaerobic Threshold**

» Since the workload increased progressively during the test and the anaerobic threshold was reached later, the workload at the threshold was greater when wearing the garment with BODIMAX Technology.



- **AND, 18% less buildup of lactic acid after 10 minutes of exercise**



■ Functionalized Garment with BODIMAX Technology
■ Placebo Garment

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BODIMAX TECHNOLOGY

What Makes BODIMAX Unique?

In efforts to create a product that endured the demands of serious athletes in and out of the water, A3 Performance developed the BODIMAX Sleeves using a much denser material than the FIR fabrics used in the above research; BODIMAX fabric is 220g (versus 150g and 90g). Additionally, the BODIMAX Sleeves are woven with a special, chlorine-resistance spandex. The BODIMAX material combined with the compressive design of the sleeves, intensifies the impact of the BODIMAX Technology and promotes even greater benefit to athletes.

So What's the Truth about BODIMAX?

BODIMAX is an innovative, fabric technology that absorbs the body's heat energy during physical activity and emits that energy back into the muscles in the form of Far Infrared Energy. This (FIR) energy is proven to stimulate blood microcirculation and thermoregulation further increasing oxygen levels in the blood, reducing lactic acid buildup in the muscles, and relieving muscle fatigue after physical activity. Incorporating BODIMAX Technology into a compression garment maximizes the technology's effectiveness and impacts the athlete's performance.

Train Better Longer. Get Better Faster.



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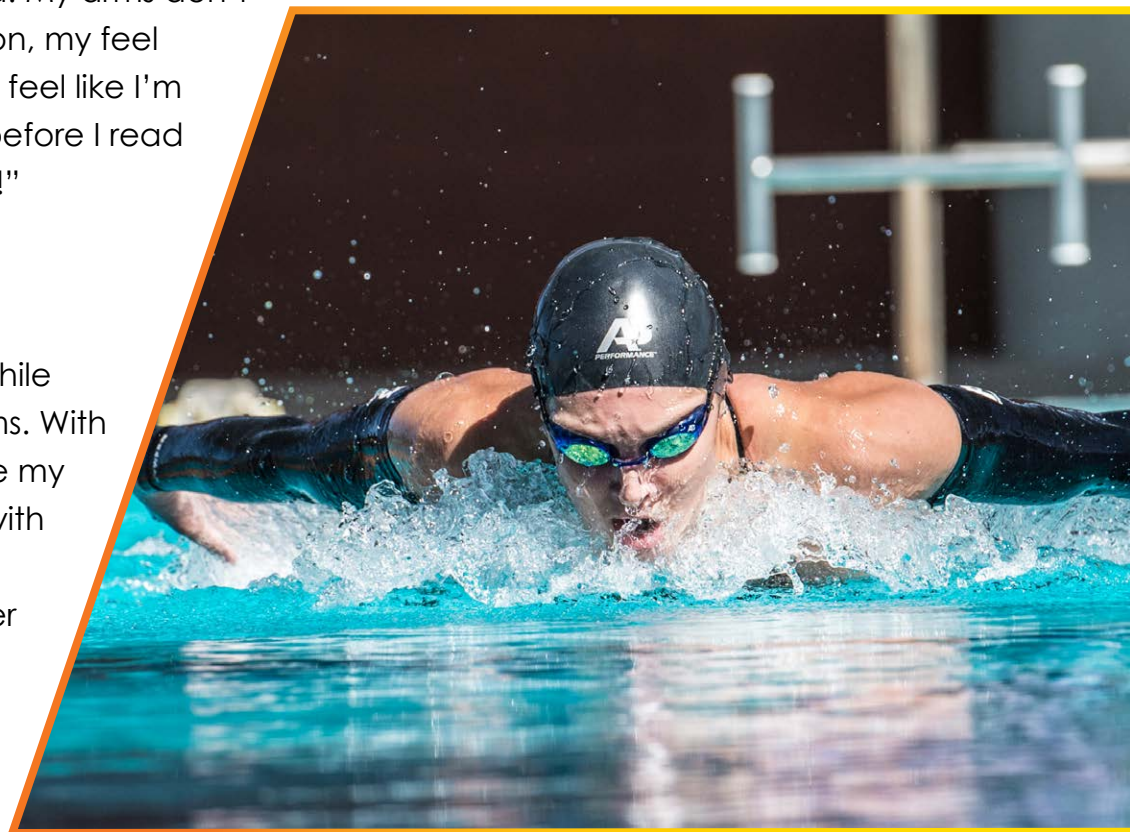
WHAT THE ATHLETES ARE SAYING...

David Guthrie - Masters World Record Holder and International Masters Hall of Fame member

"I've been training some in the BODIMAX Sleeves and I think they're excellent. I've tried wearing them outside of the pool, which offers the benefits advertised. The sleeves do everything as described. My arms don't overheat and, while I like the feeling of support with them on, my feel for the water is enhanced when I take them off and I don't feel like I'm slipping or spinning at all. I actually experienced all of this before I read much about them, so that really confirmed my experience!"

Tyler Barnes, Powerlifter and Olympic Hopeful

"One of the huge benefits of using the BODIMAX Sleeves while doing Olympic lifts, for me, is the warmth it brings to my arms. With all of the gripping I have to do with Olympic lifting, I feel like my grip lasts a lot longer since my forearms are staying warm with the increased blood circulation. On the days that I have a ton of overhead work, my triceps used to fatigue a lot faster before using the BODIMAX Sleeves. Now I get more reps in with heavier weight as I do my presses three times a week without a ton of muscle fatigue. After I take them off, that's when I really notice the increased blood circulation. You can feel the fresh blood rushing to the muscles."



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WHAT THE ATHLETES ARE SAYING...

Ivy Martin - 13-time Big Ten Champion, US Open Champion

“The BODIMAX Sleeves are unlike anything I've ever used in my training, and I 100% believe they are beneficial for all athletes. The design helps me achieve a unique feel for the water, and the compression helps my arms feel warmed up and ready to go sooner than they would without the sleeves on. In my experience, I am able to train at a higher level because the BODIMAX Sleeves delay a sense of fatigue that I typically start to feel during my workout. I truly believe in this product and its ability to improve strength, technique, and body awareness in the water.”



Darian Townsend - Olympic Gold Medalist, Three-time Olympian, Masters World Record Holder

“I have been using the sleeves for over a month now and I'm enjoying working with them. A couple of things I really like about them:

- I like that you can wear them both in and out of the water. I can put them on before I leave for the pool and then take them off when I'm done working out and at home again.
- Having them on in the water didn't affect my feel for the water. I was able to perform all four of the strokes with no hindrance from the sleeves.
- I definitely felt that my arms had better circulation with the BODIMAX Sleeves on. My arms were significantly less tired towards the end of my swim sets.
- The BODIMAX Sleeves stayed in place, whether I was diving into the pool, pushing off the walls, or swimming; the sleeves stayed tight on my arms.
- Doing dryland with the BODIMAX Sleeves on, my arms never overheated or got too sweaty. The material allowed my skin to breath and stay cool.”

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WHAT THE ATHLETES ARE SAYING...

Anonymous Athlete

"I love the new BODIMAX sleeves. I feel stronger during practice and I also pay more attention to my arm position when they are on."

AJ Colt, Club Swimmer, Male

"My arms are always less sore and tired now and I feel like they [BODIMAX Sleeves] are helping my arms to work at the same level longer. During pull sets especially, the sleeves seem to help me pull harder for a longer time."

Alysha Headrick, Club Swimmer, Female

"I can feel the water now and how much I have grabbed and how much I am losing. The [BODIMAX] sleeves make me very aware of how I am swimming in the water. The sleeves have helped me feel the water more and efficiently catch more water."

Tariq Witz, Club Swimmer, Male

"[With the BODIMAX Sleeves] I am able to recover in the pool very quickly. It takes a couple of seconds for me to be ready to swim fast again after a set."

Leslie Headrick, Club Swimmer, Female

"[With the BODIMAX Sleeves] I have a better feel for the water. They also help me to stay warmer while swimming."



WHAT THE ATHLETES ARE SAYING...

Valentina Ishchenko, Club Swimmer, Female

"I feel as though I have much more endurance in my arms. Additionally, I don't feel my arms getting as sore. My arms feel significantly less tired; I feel like I can swim longer with the [BODIMAX] sleeves on... [Without the Sleeves] I am not recovering nearly as well as I was able to when I had the sleeves on."

Abigail Steen, Club Swimmer, Female

"The parts of my arms that the [BODIMAX] sleeves cover are not as sore as the rear of my body, if they are sore at all. My arms do not get fatigued as quickly and when they do the sleeves make them feel better more quickly."

Aubrey Huffman, Club Swimmer, Female

"[With the BODIMAX Sleeves] I've felt stronger and smoother in the water."

Claudia Chen, Club Swimmer, Female

"[Without the Sleeves] I feel like I don't recover as fast after a difficult practice."

Emily Render, Club Swimmer, Female

"[Without the Sleeves] My energy is lower and my arms get sore easier and I wake up more tired and sore than when I had my [BODIMAX] sleeves on."



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WHAT THE ATHLETES ARE SAYING...

Molly Smith, Club Swimmer, Female

"When I swam for the first time without the [BODIMAX] sleeves, I could feel everything so much better. I was so aware of what my arms were doing."

Taylor Mohler, Club Swimmer, Female

"My recovery feels a lot better and I recover faster. My arms don't feel as exhausted during hard sets. I feel they can withstand harder workouts than they could without the [BODIMAX] sleeves."

David Wu, Club Swimmer, Male

"I feel like I am able to pull more water with less effort [with the BODIMAX Sleeves]."

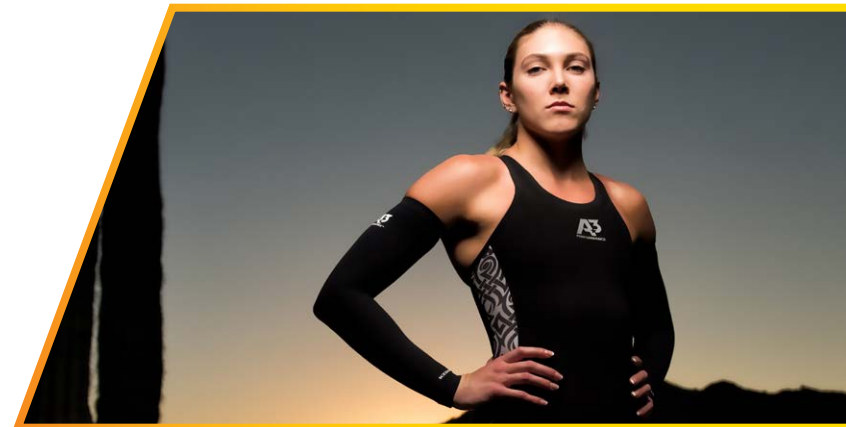


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About A3 Performance

A3 Performance, founded in 2004, is recognized as the leading innovator in competitive swimming. The fastest growing brand of performance swimwear in North America is driven to innovate the sport of swimming and to motivate swimmers to be their best and reach their goals.

A3 Performance is The Performance Swimwear Company.



THE TRUTH ABOUT BODIMAX

KEY TERMS

ATP-PC (anaerobic): high power, short duration – (Phosphagen system. It is immediate and functions without oxygen). It allows for up to approximately 12 seconds (+ or -) of maximum effort.

Glycolytic (anaerobic): moderate power/short duration – (Blood glucose and/or stored glycogen is broken down to create ATP through the process of glycolysis. Like the ATP-PC system, oxygen is not required). In fast glycolysis, more power can be generated, but pyruvic acid is converted to lactic acid and fatigue ensues quickly.

Oxidative (aerobic) – low power/long duration - dependent on oxygen, is the most complex of the three energy systems. Uses blood glucose, glycogen and fat as fuels to resynthesize ATP in the mitochondria of muscle cells.

Anaerobic Threshold (AT): is the exercise intensity at which lactate (specifically, lactic acid) starts to accumulate in the blood stream - anaerobic energy system does not utilize oxygen to create Adenosine triphosphate (ATP) and uses glycogen/ glucose.

The Aerobic Energy System: uses oxygen, and burns carbohydrate, fats and proteins. It is relatively slow at producing energy.

The Anaerobic Energy Systems: doesn't require oxygen, and produce waste products (notably lactic acid and protons). When increasing workload there is **a point at which lactic acid begins to accumulate**. This is a **crucial workload**, as lactic acid can inhibit muscle contraction and energy production and cause pain and a burning sensation.

The Lactate Threshold Measurement: is very valuable as it is one of the more sensitive indicators of fitness.

KEY TERMS

VO2 Max (maximal oxygen consumption, maximal oxygen uptake, peak oxygen uptake or maximal aerobic capacity): is the maximum rate of oxygen consumption as measured during incremental exercise. Maximal oxygen consumption reflects the aerobic physical fitness of the individual, and is an important determinant of their endurance capacity during prolonged, sub-maximal exercise.

VO2 Max Value is dependent upon several factors: the ability of muscles to use oxygen to produce energy; the ability of lungs, heart, and circulatory system to transport oxygen to the muscle; and body composition, which is the amount of fat and muscle you have.

The **factors affecting** are often divided into supply and demand. Supply is the transport of oxygen from the lungs to the mitochondria while demand is the rate at which the mitochondria can reduce oxygen in the process of oxidative phosphorylation. Of these, the supply factor is often considered to be the limiting one.

Work: term used in exercise physiology for the power produced by a living body. May be expressed directly in units of power (joules per second (J.s⁻¹) or watts (W)) or indirectly in terms of oxygen consumed per unit time.

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