

Carbon Duo

1. **What is the Carbon Series and how is arena's approach to elite technical racing different than other brands?**

Many competitive swimmers old enough to remember the London Olympics probably remember arena's explosion in elite technical racing on the international stage with the introduction of the Carbon Pro – this iconic suit, and its striking neon colors, set the trend for color in elite technical racing suits



and propelled Rebecca Soni to her historic Gold Medal and World Record in 2012.

The Carbon Pro was not only one of the most successful and groundbreaking technical suits ever released in the sport of competitive swimming, it also marked the beginning of a new era for arena in technical racing innovation. Beginning with the Carbon Pro – the successor to the very popular R-EVO+ suit before it – arena began exploring the concept of different racing suit designs for different strokes, distances, body types, etc. Utilizing the benefits of a proprietary carbon-fiber infused fabric (from which all Carbon suits take their name), the arena innovation team submitted multiple designs to FINA that applied the traditional technical suit benefits of compression, drag reduction, etc. in different ways to accommodate differences in body movements and/or personal preferences across all swimmers. This design ethos manifested itself in 2014 with the introduction of the Carbon Flex – a suit utilizing the same carbon-fiber cage fabric as the Carbon Pro, but in a design that offered more range of motion and mobility for IMers, Breaststrokers, or those that just liked the feeling of more freedom in the hips. This led to the innovation of the Carbon Air shortly thereafter – a suit designed to offer a blend of compression and comfort in an extremely lightweight suit that feels like a second skin. While all other brands were still using the traditional “good, better, best” approach to their racing suits – based mainly

on price differentiation with a single “elite” suit - these variations in the application of compression, mobility, comfort, and fit in arena’s elite technical race suit offerings inspired the “Every Swimmer is Different” campaign in 2015 and arena became the first (and remains the only) brand to offer multiple elite technical racing suits designed to give every swimmer the ability to customize their experience based on their unique individual requirements.

CARBON TECHNOLOGY EXPLAINED

POWERSKIN carbon.flex
max power + flexibility

POWERSKIN carbon.pro
maximum power

POWERSKIN carbon.air
maximum comfort

POWERSKIN COMPARISON

POWERSKIN carbon.flex
FREEDOM OF MOVEMENT

POWERSKIN carbon.pro
THE POWER OF CARBON

POWERSKIN carbon.air
INTELLIGENT COMPRESSION MEETS COMFORT

THE CARBON TECHNOLOGY

2012 2014 2015

POWERSKIN carbon.pro **POWERSKIN carbon.flex** **POWERSKIN carbon.air**

For over a decade, arena has been developing and applying new technical features to its range of racing swimwear, with the aim of constantly offering swimmers a cutting edge in their performance.

SWIMOUTLET.com

Carbon fibre is made up of very thin strands of carbon – even thinner than human hair – which can be twisted together like yarn, and then woven into cloth. It’s five times as strong as steel and twice as stiff, but only one third of its weight.

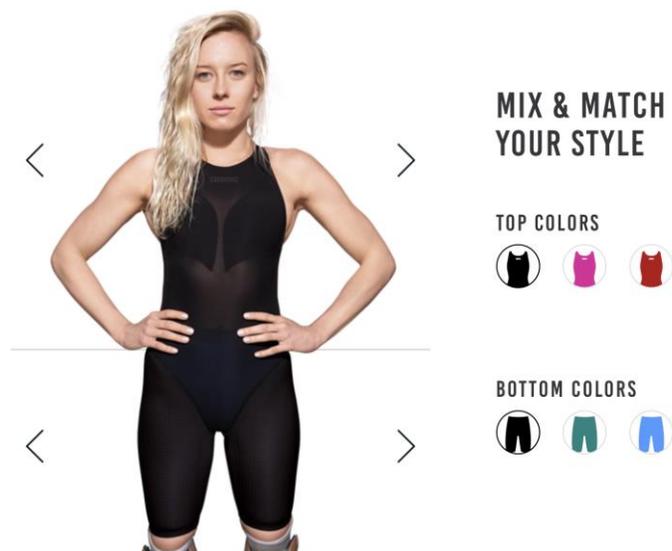
By weaving elastomer yarns across a special carbon fibre grid, the inherent strength and stiffness of the carbon threads serve as a protective web that regulates stretching by stiffening the fabric once a critical stress level is reached, thus preventing uneven stress damage.

Arena extended this range architecture in 2016 with the Carbon Ultra – a highly compressive suit utilizing a next-generation fabric with 3 times the carbon fiber as all suits before it – and today, with the introduction of the Carbon Duo, offers (4) elite technical racing suits in addition to it’s mid and entry level range of ST2.0 and R-EVO One products.

2. **According to the information in the official company launch last week, the Carbon Duo is the world’s first 2-piece technical racing system – can you tell us a little more about this suit?**

The Carbon Duo is unlike anything the swimming world has ever seen – and is a truly groundbreaking shift in the way women’s elite technical racing suits are conceived and designed. For years we have been hearing the horror stories that women and girls of all ages have when talking about their tech suit experiences. We’ve all heard or had the same experiences...bloody knuckles from 45 minutes trying to squeeze into a suit 3 sizes too small, fingers popping through a brand new \$400 suit, 2-3 friends trying to

get straps over your shoulders, splitting seams on the blocks, etc...this is just the beginning. For years, our engineers and designers have been asking the question “how can we change these experiences and make wearing a tech suit **enjoyable?**” This question is nothing new to arena – and was actually the inspiration behind the Carbon Air – a suit that was designed offer a high level of carbon fiber-based compression, but could be put on in 5 minutes by most women and worn for an extended period of time without feeling the need to pull the straps off the shoulders to breathe between events. Following the incredibly positive feedback on the launch of the Carbon Air (which was updated in 2019 with the introduction of the [Air Squared] Air²), our engineers started to look at how to take this concept to the next level...the Carbon Duo was born. Obviously this was not a simple innovation – as FINA has very strict rules for what can and cannot be done with fabrics, seam construction and placement, linings, etc. for elite technical racing suits. However, after several **years** of prototyping, athlete testing, and FINA reviews, we landed on a final product that offers all the advantages of a one-piece technical racing suit in a design that is 100% FINA approved (when both pieces are worn together) and solves a number of challenges that all women have experienced with their racing suit. The Duo is the first suit that can be **customized** by women for their unique application – both in compression, comfort, **and** style. Across the multiple sizes and colors offered in the top and bottom components, the Duo offers women 49 different sizing and 16 different color combinations that allow her to find the perfect suit based on her unique body shape, preferred level of compression, and, of course, favorite color combination. No other suit in the history of competitive swimming has provided such extensive range.



3. Why did you feel a 2-piece racing suit was needed in the industry?

The inspiration behind the Duo was simple: give women swimmers a race suit designed specifically for them. Unlike most suits that are designed to fit a predefined body type, the Carbon Duo allows women to customize their fit and compression by sizing the top and bottom individually. For many women, finding a tech suit can be incredibly challenging...the legs fit great but the top is too loose, the top fits perfect but the legs have no compression, the fit is right but the straps won't get over the shoulders, etc. With the Duo, there are **49 different sizing options** that provide **every** woman a fit that is right for her and as provides an experience as close to a custom suit as the FINA regulations will allow. By isolating the two components, the Carbon Duo requires **zero compromise** in two-pieces that feel and function as a one-piece suit. There has never been **anything** like it in women's swimming.

4. How do you recommend that women size the suit given that this has been such an issue in the past?

Sizing in racing suits has been unnecessarily complicated over the years and has left a lot of women scratching their heads when selecting their tech suit – especially when presented with the challenge of trying new brands. Due to inconsistency across sizing in tech suits from brand to brand, switching costs can be prohibitively expensive – leading most women to simply stick with what they know vs. the risk of buying an incredibly expensive suit that doesn't fit. In addition, many retailers will not even allow women to try on the suit without purchasing it – so the sizing obstacle prevents a very real challenge for women that has largely been ignored...until now. At arena, we have always viewed sizing differently and our race suits are designed to offer the correct level of compression and performance **in the same size** you wear every day in your training suit. Many women are scared by this when first trying an arena suit – as the industry has taught them that they need to size down 2 and sometimes even 3 sizes in racing to get the “right” level of compression that they feel they need to perform. We find this system counter-intuitive; after all, the size is just a label in the suit, so if you wear a 28 Monday through Friday, your 28 racing suit should deliver the performance you expect without the complication and confusion. The Duo is no different – although the sizing is even more intuitive given the unique two-piece construction. Because the top is a very similar silhouette to a traditional training suit, our recommendation is to start with your training suit size for the top of the Duo system. This should deliver the right amount of core compression – but also ensures the correct fit in the shoulders so the cutting straps, and resulting restriction, is a problem of the past. For the bottom, it's all about preference and body shape. Women with a more athletic build, wider hips, or those that just prefer more mobility in the legs can opt for the same size as their training suit and will experience a second-skin like feeling in the Duo system when top and bottom are worn together. Women with a more slender build in the hips and thighs, or those that like a high level of compression on the legs for maximum power (eg. sprinters), can opt to size down 1 or 2 sizes (body-dependent) in the bottom to give maximum support and compression from the waist-down. No other suit ever developed allows this customization based on body, stroke, distance, or simply personal preference.

5. Is there going to be a men's version of the Duo?

HOW TO RACE IN CARBON DUO

- CHOOSE TOP IN YOUR TRAINING SUIT SIZE.
- CHOOSE THE LEVEL OF COMPRESSION FOR THE BOTTOM.
DOWNSIZE TO INCREASE IT.
- CHOOSE THE COLOUR COMBINATION YOU PREFER.
FOR TOP AND BOTTOM.
- YOU ARE NOW READY TO RACE.
FINA APPROVED ✓

No. While our engineers likely could have figured out a way to create and market a men's version of this suit, the simple fact is that the Carbon Duo was inspired by and is designed to resolve a problem that only exists for women in our sport. For years, really since the beginning of the "tech-suit era," women have struggled with fit and comfort in elite technical racing suits. These challenges, the stories from our female Team arena athletes about their experiences coming up in the sport, and the feedback from our young club swimmers fitting their first tech suit for the first time was our inspiration for the development of the Duo and these challenges simply do not exist for men's suits in their current form. The Duo is designed for a single purpose: to be uniquely you, and is the only suit designed and offered exclusively for women.

6. I thought 2-piece suits were illegal for competition by FINA. Is this suit legal to compete in at all levels of FINA events?

Yes. Both the Carbon Duo top and bottom suits are 100% FINA approved and legal for all FINA and USA Swimming sanctioned competition and each component of the system carries a FINA approval mark on the suit. However – it is critical to note that the FINA approval exists **only** when the two pieces are worn together as a system. Although it's unlikely (though stranger things have happened) the bottom would not be approved for use by itself as a stand alone racing suit. Likewise, a woman would not be permitted to wear a training suit over the bottom or simply wear the top by itself without the bottom; the suit is only FINA approved when worn as intended with the Carbon Duo top and bottom together as one.

7. Are any of your athletes wearing the suit? How was the suit tested?

Many of our athletes got a sneak peak at the Carbon Duo during it's development phase last year and have been through several rounds of testing with the suit. However – this is still a very new concept and we all know how specific swimmers can be about their tech suits when they find "the one" that works. With that being said, two of our most involved athletes in the testing of the Carbon Duo, World Champion Bronze Medalist Madisyn Cox and multiple-time (too many to count, actually) Paralympian Jessica Long, **love** the suit and have worn it in several competitions thus far. Don't be surprised if you see the Duo show up on the international stage this summer in South Korea.



8. Doesn't a two-piece design capture water / let water flow through and create drag?

This is very common question. The simple answer is a resounding NO – but the technology and design behind this are much more intricate and complex. Like all arena suits, the Carbon Duo went through a vigorous and extensive process of hydrodynamic and real-world flume (which is essentially an aquatic “wind-tunnel”) testing throughout its development. At every stage, the data was evaluated, small refinements were made, the suit was re-tested, and the process repeated until we arrived at the final product you see today. The end result is a suit that functions almost identically to a traditional one-piece racing suit when worn together as a system – and the suit does not create any more drag or opportunity for water-entry than any existing tech-suit designs. The secret to the Carbon Duo is in the fabric and the way the two separate components interact with each other. With the Carbon Air, Flex, Ultra, etc. the external fabric sits on top of an internal lining that creates additional compression zones where needed and offers the coverage and privacy that women expect from their tech-suit. The Carbon duo is different. The bottom of the Duo itself is unlined and constructed from a single piece of carbon-cage fabric. The top, constructed from an extremely lightweight fabric similar to the Carbon Air, is unlined in the lower portion of the suit but uses an internal lining and modesty panels in the chest that are very similar to the new Carbon Air². Where the bottom and top come together is where the magic happens; because these two layers are working together, they create their own lining for each other while also eliminating unnecessary weight and the resulting drag from additional fabric. In other words, the bottom is unlined in the legs – but the silhouette of the one piece over top of the bottom creates a lining and privacy effect when laid over top. Likewise, the top is unlined (which is also why it cannot be worn as a stand-alone suit) but the bottom creates the internal lining when the top is laid over it. The result is a suit that actually has **less** fabric (think **lighter**) than the Carbon Flex, but looks, feels, and performs like a one-piece suit when worn together.

SEE VIDEO

9. How does the top stay in place when worn over the bottom? Doesn't the suit move and "ride up" when moving in the system?

In the same way that the suit was designed to create minimal drag consistent with the range of Carbon Series suits, the two pieces were designed to "stay put" and function as a single system without shifting during use. When looking at the suit for the first time, it's easy to assume the top is similar to a traditional training suit and thus would move around the way a training suit might if worn over another suit. This could not be further from the truth; the top of the Carbon Duo is an incredibly technical piece of engineering and design that is every bit as high-performance as the other suits in the Carbon Series range. This top is constructed from an extremely lightweight carbon-fiber fabric that, unlike the bottom (that features a carbon cage fabric with horizontal and vertical strands of carbon fiber woven into the suit), utilizes carbon fiber bands running perpendicular (across) the body. These bands encompass the torso and provide the compression through the core that stabilizes the upper body. The leg openings of the suit feature 360-degree silicone grippers on the inside openings that are designed to grip the fabric of the Duo bottom underneath. Due to the extremely light weight of the top fabric, these grippers anchor the suit in place at the legs and hips and prevent any movement or riding-up even during the most dramatic body movements. However, because the top and bottom are actually separate components, they also allow for dramatically enhanced mobility in full body flexion or extension such as during turns or dives. In these motions, rather than requiring stretch from the fabric and pulling against the shoulders, the top and bottom pieces act like a joint – sliding over each other to move with the body and almost completely eliminating any fabric restriction.