
Ironman? Superman – PART 2

Patent Attorney and keen “endurance eventer” [Stuart Greenwood](#) continues his dive into the world of IRONMAN to report on the breaking of the latest seemingly unbreakable athletic barrier and the technology that helped make it possible.

PART 1 can be read [here](#)

Part 2 - The Swimsuit

After looking at the technology behind the goggles of Matthews and Blummenfelt in our earlier article ([link above](#)) we now dive (pun-intended) into the world of high-tech swimsuits.

IRONMAN athletes swim and run in their suit. This means the design of the suit is subtly different from that of an elite swimmer's.

Blummenfelt wore the latest version of the “Insane Skinsuit” made by [Trimtex](#). This is a long-sleeved triathlon suit, made in one piece to eliminate the need for seams, and unlike a swim suit, focusses on dissipating heat to keep the athlete as cool as possible (particularly important for the running leg).

This focus on heat dissipation led Trintex to experiment with many different material thicknesses in various areas around the suit to achieve a balance between support, comfort, lightness and cooling. It also led, quite simply in hindsight, to the suit being white. White being the best colour to reflect sunlight and thus heat.

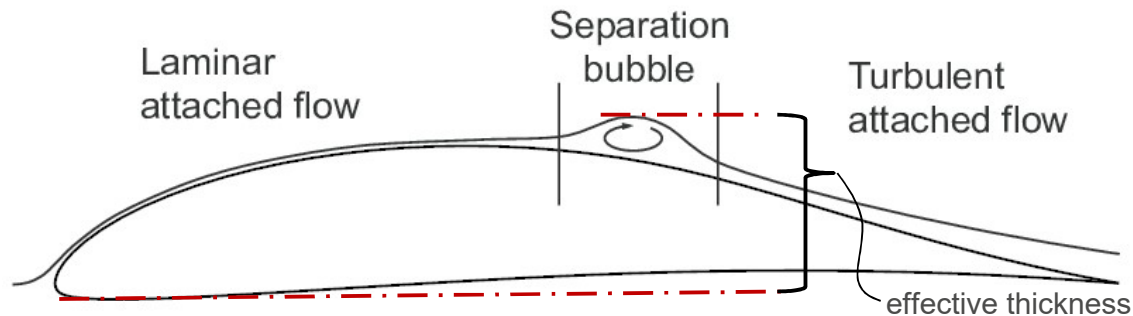
The suit is also incredibly light, made from a woven elastane polymer blend and bonded together with tape so there is no stitching anywhere in the fabric.

Another particularly important consideration when making a “long-course” suit, i.e. one in which the athlete will cycle 112 miles, is aerodynamics. The suit’s long sleeves improve aerodynamics, both when swimming and cycling, as do what are called the suit’s ‘turbulators’, which are particularly crucial on the bike section.

Turbulators are known in many technical areas where there is a focus on air (or more accurately, fluid) flow; for example from F1 cars and aeroplane wings, to boilers and even water softeners. Broadly speaking, turbulators are devices which turn a laminar boundary layer into a turbulent boundary layer. In layman’s terms this means a device which disrupts or breaks-up the smooth flow of fluid around a body.

You may naturally think that smooth fluid flow around a body is what you would want to give the best aerodynamics. However, when fluid has passed around a body it separates (i.e. becomes detached) from that body at some point and this separation forms something called a “separation bubble”. The separation bubble increases the effective thickness of the body which adds drag.

This is illustrated most simply in the below drawing which is a side view of a wing:



And so, somewhat counterintuitively, breaking up flow with turbulators stops the separation bubble from forming and actually reduces drag – significantly improving aerodynamic performance. The turbulators on the Trintex suit are raised circular pieces of fabric, spaced around the shoulders and upper back. They are a bit like the inverse of the dimples on a golf ball (the golf ball dimples being there to act as “turbulators”).

All these innovations added up to a fast, lightweight, and comfortable suit which helps the athlete achieve their full potential.

Next time, we look at the bike used, and the marginal gains made there by using the latest technical advancements.

If you have any questions about IP protection for your own products, or about the IP protection of others, please do not hesitate to contact us at aat@aathornton.com to see how we can help.

