

2017

Innovation in Composite Design | **Winner: Lentus Composites**

Design and manufacture competition bike frames.

Overview

In June 2015, Lentus Composites were awarded the project to work with leading bike manufacturers Cervélo, to design and manufacture competition bike frames. Cervélo are world leaders in making aerodynamic bikes, they are known as the manufacturer of "the world's fastest bikes".

The challenge given to Lentus was to take the low drag aerodynamic shape developed by Cervélo and match or exceed the performance standard of the ultra-stiff, ultra-light UKSI bike within the tight packaging constraints and reduced cross sections of the highly aerodynamic geometry.

Lentus employed its wide ranging expertise in material selection, laminate design, test and development, tooling design and manufacture and component finishing to deliver a successful outcome. The structure of the bike was designed in the virtual environment using specialist software allowing over 50 variants and iterations to be simulated before committing to the final laminate designs for test. Lentus' vertically integrated manufacturing capability allowed for all of the tooling and test rigs to be designed and manufactured in parallel with the design of the frames to deliver a fully concurrent engineering process and deliver the project in industry beating time scales.

The initial prototype frames were tested at Lentus and Cervélo prior to being tested on track by the athletes. The development of the frames was split into two streams, one to further develop the endurance frame and the other for the sprint frame. The result being a stiffer and lighter sprint frame with new geometry that provided a significant performance gain in short races and a lighter, stiffer endurance frame optimised for aerodynamic performance in long distance races. Further customisation was enabled through the design and manufacture of athlete specific handle bar components using a combination of composites parts and metal additive layer manufactured components. This collaborative and iterative process ensured that the athletes were delighted with their new bikes.



Lentus Composites receiving the award from Jeremy Whittingham of the Advanced Engineering Show.

"I am so proud of the team at Lentus for their sheer hard work on this challenging project. We not only helped Cervélo with the design and manufacture but also the testing and delivery to tight deadlines. This was an exciting project for all involved and we look forward to continuing our work with Cervélo in the future."

**Simon Odling, Managing Director,
Lentus Composites**

The Composites UK Industry Awards are presented at the black-tie dinner which is aligned with the Composites Engineering Show in Birmingham.

Keep an eye out for our annual nomination process every May for your chance to apply.

www.compositesuk.co.uk/awardsdinner