Sports engineers aim to give Tour cyclists the edge

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Credit: University of Adelaide

University of Adelaide sports engineers have teamed up with Swiss company Scott Sports to help develop what is believed to be the world's fastest road cycling helmet – and it will be put to the ultimate test by an

Australian cycling team in competition at next month's Tour de France.

Called the Scott Cadence Plus, the helmet will become part of the official kit worn by Australia's ORICA-GreenEDGE Cycling team.

The helmet was launched last night (Australian time) in Switzerland and will be available the world over for professional as well as amateur cyclists.

The aerodynamic development of the helmet was led by Associate Professor Richard Kelso in the University of Adelaide's School of Mechanical Engineering, with the help of PhD candidate Ryan Leknys and several engineering honours students.

"One of the most satisfying aspects of this project was seeing all the science and engineering 'brought to life' in this product, and knowing that professional riders will be wearing the helmet in both the Tour de France and the Rio Olympics," Associate Professor Kelso says.

"From an aerodynamics perspective, the Scott Cadence Plus performs better than any of the leading helmets in the market today.

"Depending on the helmet it's tested against, this new helmet could provide anywhere from a 0.2-metre to a 2-metre advantage over its competitors in a bunch sprint. In professional cycling terms, that could make the difference between wearing the winning jersey or not," he says.

Associate Professor Kelso says the global launch of the helmet "marks the end of a two-and-a-half-year development process that began with a blank sheet of paper and an ambition to build the world's best cycling helmet".

"Our goal was to produce a helmet design with the lowest drag possible, but also to ensure the rider's head is well cooled and, above-all, well protected," he says.

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"After many months of wind-tunnel work and theoretical modelling, we were able to provide Scott with a concept that we believed would outperform any of the leading helmets currently out there. The Scott design team then turned the helmet into a real product, and also a thing of beauty."

The Cadence concept was also used to design a second road cycling helmet, known as the Centric Plus, which provides additional cooling for the rider's head and very low drag. Both helmets offer a high level of head protection through a system known as MIPS (Multi Directional Impact Protection System).

To test the drag and cooling efficiency of the helmets, the University of Adelaide team built a full-size cycling mannequin for wind tunnel testing and a heated mannequin head.

The helmet prototypes were tested extensively by Australia's ORICA-GreenEDGE riders prior to production. Both helmets will be worn by ORICA-GreenEDGE cyclists in the upcoming Tour de France, and by numerous cyclists and triathletes in the Rio 2016 Olympic Games.

"This work is a perfect example of university researchers working closely with a global company, with direct benefits for industry and the community. Along the way, we've helped to provide our students with a practical, industry-connected educational experience," Associate Professor Kelso says.

Scott Sports Senior Product Manager John Thompson says: "Our goal was to deliver the very best performance advantage to our professional road and mountain bike racers.

"We chose to continue our successful partnership with the University of Adelaide due to previous successes. We have worked with Associate Professor Kelso for a number of years and he is a key member of our high-performance helmet development team. His extensive experience, innovative approach and enthusiasm for delivering performance is invaluable.

"The results speak for themselves, with both new helmets exceeding our

expectations and outperforming the competition in controlled wind tunnel testing.

"We couldn't be more proud and excited to be delivering these new helmets to our athletes and to have Associate Professor Kelso and the team at the University of Adelaide on our side," Mr Thompson says.

Provided by University of Adelaide