

Aerodynamic research to boost the performance of Team Sunweb riders

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Abstract

Innovations in elite cycling become more and more important in order to give a competitive edge over other pro teams. Within Team Sunweb one of the main fields of interest for innovations is aerodynamics. As aerodynamics counts for almost 90% of the total resistance of a rider (Chowdhury (2011), Debraux (2011)) innovations can lead to substantial performance improvements.

Through a collaborative partnership with the Delft University of Technology, together with other partners Team Sunweb is involved in the development of the Ring of Fire. The Ring of Fire is an advanced system which allows us to improve the aerodynamics of riders and materials in a realistic environment. By performing outside aero tests, without the limitations of track and wind tunnel testing environments, crucial information on the air flow is gathered by flow visualisation techniques (see Figure 1). This helps the Team in making decisions on material aerodynamics, individual and group bike positioning – factors essential for time trial success.

Next to the Ring of Fire wind tunnel tests are still performed to optimise rider aerodynamics and test material properties in a controlled environment. For example, fabrics testing using cylinder testing to prototype testing on mannequins provides highly valuable information to inform end products for riders.

In addition to aerodynamic testing, projects on cooling and heating, time trial modelling and efficiencies in descending using both existing data and new testing are undertaken within the Delft University of Technology and Team Sunweb technological partnership. This partnership leads to new knowledge and direct applications in professional sports to give the Team a competitive advantage.



Fig. 1 Ring of Fire testing (screenshot – Team Sunweb (2019)).

References

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