Aerodynamic development of a time-trial bicycle helmet: From CFD to le the eulerian multiphase flow modelthe eulerian multiphase flow model - Tour de France

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CFD analysis is becoming a tool of choice in the competitive cycling industry. Cycling product development has taken advantage of integrating CFD in its development process. Significant improvements were made, mainly for drag reduction. CFD also serves the marketing department: multicolored CFD pictures and other engineering data is now the standard for cycling products promotion.

Following this trend and with the help of Lx R&D, Louis Garneau Sport introduced CFD in the development of what was going to be the Vorticce, their best time-trial helmet to this date. The main benefits they experienced, besides performance improvements, were faster time to market and reduction of development costs.

This presentation will focus on the CFD analysis of the Vorticce helmet along with wind tunnel test data. We will show that consideration of multiple rider head angles is crucial in the development of this equipment. We will also discuss the addition of vortex generators and their effects on drag. Improvements in the helmet development process brought by the use of CFD will also be demonstrated. The presentation will conclude with examples of how CFD was used for marketing of the helmet.

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