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The wind-averaged aerodynamic drag of competitive time trial cycling helmets

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Abstract

This paper documents a wind tunnel test program that measured the aerodynamic drag (F_d), lift (F_l) and side force (F_s) of 12 contemporary time trial (TT) helmets at yaw angles of 0 to 15°. F_d measurements at yaw were subjected to a novel analysis technique adapted from the automotive fuel efficiency literature to provide a single wind averaged drag at a velocity (V) of 14.75 m sec⁻¹ (53 Kph or 33 mph). Ranked wind averaged drag measurements of TT helmets provide a simple performance index and it is recommended that this analytical procedure be adopted by the bike industry to permit uniform F_d comparisons of helmets, wheels, frames and other components that are subjected to yaw angle wind tunnel tests.