

Taking full advantage of Zipp's patented 'Bulging' rim profile, Zipp's ABLC technology is now available in rims too. The idea is that these highly modified and designed rim shapes can only take advantage of the airflow if the air is sticking to the surface of the rim. With a V shaped rim or flat-sided rim, the airflow becomes separated from the leeward side of the rim as soon as the rim begins to face airflow more than 1 or 2 degrees off axis. This separated airflow creates a vacuous region behind the rim, which is the primary source of pressure drag on the wheel itself. With a curved section, we are able to keep the airflow on the rim surface out to 7 or 8 degrees of yaw, but eventually the flow begins to separate or 'stall' on the backside. With the dimples, we are forcing the airflow into a higher energy state, forming a turbulent boundary layer near the surface of the rim, which allows the air to remain attached to the rim even at higher angles.

The tradeoff here is that we are creating a slightly higher skin friction drag on the rim, but since this is some 10 times lower than the pressure drag, we find a bulged rim to be remarkably analogous to a golf ball in that the pressure drag reduction is many times greater than the total skin friction drag. Whereas most aerodynamic rims show minimum drag at between 5 and 10 degrees in the wind tunnel (conditions only seen 20-25% of the time in the real world) and then show increasing drag through higher wind angles, the ABLC allows the minimum drag to occur between 10 and 20 degrees and be much lower than smooth sided rims.

The new technology has allowed for rims that demonstrate lower drag values at every single measured data point than previous designs, but more importantly have minimum drag in conditions that riders experience the most often. The concept is quite simple, roughly 50% of real world riding occurs with effective wind angles between 10 and 20 degrees, at angles between 0 and 5 degrees, the drag is primarily affected by tire choice, and at angles from 25 degrees and higher, the surface area of the wheel becomes the primary player. This new technology allows us to shift the sweet spot of the rim into the ideal zone (10-20deg.) while still reducing drag at all other values. The result is a wheel that is not just faster in one condition, but faster through the range of conditions you will experience the majority of the time.