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Rouge Roubaix

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Product Review: 2009 Zipp 808

By TRP Staff



**2009 Zipp 808 wheelset, tubular
1462 grams, 16 spoke front, 20 rear.
Zipp Tangente tubular tires**

There's an unspoken rule of product reviews: lull readers in with a bunch of verbiage about the construction and coolness of the product so as to build buzz, then layer in the evaluation towards the end. Whatever. Here's the bottom line with the Zipp 808s: **if you could inject the performance boost they give, they'd be outlawed.**

They have saved me anywhere from 10 to 30 watts on rides as compared to a set of Flashpoint 60s, which aren't exactly aero-pigs. On my road bike, simply swapping out the Flashpoints for the 808s lowered the overall coefficient of drag (cda) by 0.039; that reduction in drag means that my 808-equipped road-bike comes close to the cda of my flashpoint-equipped time trial bike; I don't feel like sharing the cda from the time trial bike and 808 combination, since it would expose just how weak a time trialist I really am). These tests were conducted on the same stretch of road under virtually identical weather conditions. While they are not a complete substitute for a wind tunnel, they replicate the results obtained by Zipp and by Roues Artisanales, which show the 808s absorbing 15.7 watts of energy at 30 mph (<http://www.rouesartisanales.com/article-15505311.html>). (For comparison, a typical aluminum rim with bladed aluminum spokes absorbs around 32 watts at 30 mph). Since the power meter I use can store the aero data for multiple riding configurations, I've substituted the data for selected rides to get a rough idea of the differences between the 808s and my other wheelsets. To give one example, a recent hour interval set would have required an average of 245 watts with the Flashpoints; with the 808s: 212.

That's not hype.

Still, a West Texas Spring—not to mention Walburg—offers frequent reminders that there IS a learning curve involved with riding and racing these wheels. They will catch a perpendicular (90 degree) cross-wind. Up to 25 mph, however, even the 808 front wheel rides predictably and manageably (for me, at least) in steady cross-winds. Gusting cross-winds, however, do create handling problems. To be fair, though, I had similar problems in the gusts at Walburg, which I rode on low-profile clinchers after I was talked out of riding the 808s (and I watched others riding 808s—of course, they were carrying around more weight than I was).

In every other situation (short of big climbs),

however, the 808s are the best wheels I have ever ridden. The excellence starts with the re-designed hubs (note to the folks in Speedway—it's time to revise your owner's manual! The diagrams refer to the old hubs . . .). Even without ceramic bearings, these hubs are ridiculously smooth. The folks at Zipp are justifiably proud of their exclusive use of a new, harder Aluminum alloy in these hubs (and they've also ditched those questionable carbon fiber dust caps. Thanks!).

They are also proud of the fiendish attention to detail in the proprietary machining—which is F1 quality. As much as I like that stuff, though, the crucial detail is that these hubs WORK. The front wheel spins for easily more than a minute—and the bearing assembly is balanced finely enough that the tire valve produces a pendulum motion as the last of the kinetic energy ebbs away. I don't think I've ever felt a smoother rolling hub—not Campy Super-Record, not Chris Kings, not my trusty dt/hugis, you get the picture.

The spokes are straight-pull Sapim CX-rays, laced to a ridiculous 100 kgs of tension on the front wheel and drive side of the rear. Sapim makes the best high-performance spokes, not least because their aero profile offers the least wake-turbulence of any conventional spoke (you could fit the disturbance caused by one-and-a-half CX-Rays in the wake created by a conventional 14/15 gauge spoke. The larger the frontal area (or, side-exposure, with any form of side-wind) the greater the spoke-induced turbulence. As the Roues Artisanal article puts it, "mixing flat rims and wide spokes, [conventional wheels] behave as parachutes at high speeds." Indeed, limiting the number of spokes, minimizing their aero profiles, and minimizing their length are significant factors in producing the aero efficiency of the 808s. But the main thing I noticed was that incredible spoke tension: thanks to that tension the 808s wind-up to speed as quickly as lighter wheelsets whose hubs and rims would not withstand such a high tensile load.

And that brings us to the rims themselves. By now, most readers of this magazine know about the dimpled-surface (which Zipp calls ABLC—Aerodynamic Boundary Layer Control) and the toroidal shape of Zipp's rims—which force air to slide along the rim instead of stalling, thus reducing drag. In order to withstand such high spoke tensions (and to address previous impact issues), Zipp practically redesigned the entire rim for 09. The fiendishly detailed lay-up pattern is still there, as are the dimples (although the precise pattern of dimpling has changed some). The biggest changes are to the rim bed and the spoke bed. While most of the 808 rim is fabricated (by hand) from unidirectional carbon fabric, the spoke bed is formed from layers of woven carbon fiber because of its ability to withstand loads and impacts. The rim bed—also formed from woven, rather than uni-carbon, incorporates Kevlar threads in a formation that Zipp calls a "Carbon Bridge" to better absorb and diffuse impact loads. (And, beyond being aerodynamically efficient, the redesigned rim shape also helps to

diffuse impacts, which should improve durability—it definitely makes for a comfortable ride).

While I can't speak for slamming into cobbles at 35 mph, I have hit pot-holes, jumped curbs, ridden gravel roads, chip-seal, and, my personal favorite, done intervals on the World War II-era concrete slab road running through Camp Barkeley. In addition to having been paved in 50-yard sections (with gaps between each section), the 66 or so years of exposure to West Texas weather since this road was built have wreaked havoc on its surface (and there has been no county maintenance). Every slab has an assortment of settling cracks and gaps and a scattering of pot-holes. Imagine my surprise when the 808s soaked up the gaps and floated over the cracks. This comfort—which extends to chip seal and gravel roads, by the way—partly involves what Zipp calls their VCLC system—which is essentially a vibration-damping layer embedded in the rim. The other part, I think, involves how the re-designed rim interacts with the tire.

Part of the rim re-design involved extending the width of the rims so that the 21mm Tangente tires form a reasonably aero shape when mounted on the 808 rim. For comparison's sake, a dt 1.1 rim is 19.3 mm wide—the 808s are somewhere around 22-23mm at the brake track. Accordingly, there's an excellent chance that in addition to swapping out brake pads, you'll be adjusting your brake cable for these wheels to fit between your brakes. And even then you'll probably need to open the quick releases for the 808s. They're a wide rim. The center of the rim includes a molded-in guide for the center-seam of a tubular—a nice touch which facilitates centering the tire on the rim during installation and gluing.

I was prepared to not like the Tangente tires—they are billed as being 21mm and do not seem especially supple before installation (and that's especially so when you compare them to their cousins, the Vittoria Open CGs or Tubulars). Add to that the fact that I've spent the last several months riding tubeless clinchers at 95 psi and that Zipp strongly suggests riding the Tangentes at 121-126 psi for my weight, and you can understand my worries that I was about to get beaten to death by a super-stiff rim and a really unforgiving hard and narrow tire. [Another note to Zipp's copy-editors—the label for the Tangente tires has the bar psi readings flipped—unless 8.34 bar is somehow more than 8.68 . . .] And for any of you'll older readers that remember the wonderful days of 19mm clinchers inflated to 150psi, you'll be able to understand my worries . . . which were rapidly replaced by amazement at the comfort level. There is a difference, though, between the "squishy-fast" roll of a tubeless clincher and the "magic-carpet-on-rails" feel of the Tangentes. Beyond the VCLC layer, however, I'm convinced—mostly because the only other wheel I've ridden with this level of comfort also had relatively wide rims—that a significant part of the 808s' ride comfort comes from the super-wide rim, which creates a different pattern of shock dispersion than with a narrower rim. Further, when I rolled the tires out, they measured out to be the same size as the nominally 23mm tires I had been riding. Lastly, the Tangentes are durable and shed water really well.

In sum: With the Zipp 808s and the Tangente tubular, you can buy speed. For almost every race in Texas and in most conditions, these will do double duty as a race- and time trial wheelset. The only problem is that they're so comfortable you won't want to put your regular wheels back on.

[ed note: updated documentation available at <http://www.zipp.com/wheels/detail.php?ID=34#>]