



Being Zipp 808.

When Andy Paskins of Zipp showed up at our world headquarters with a set of 404 clinchers and 808 tubulars, all the hairs on my arms stood on end. Let's just say I was excited to roll a few miles on the wheels.

I attached the 808's to a Colnago CX-1 and bliss set in. Though the 2009 model is not much different than the '08's, Paskins explained that internally the new 808's have some significant refinements.

Riding a set of 808 tubs is like going from clay wheels to polyurethane ones on a skateboard. You were used to the clay and it worked fine and you grew immune to its limitations. However, when you latch on something that is steps ahead of what you have, it makes you wonder why you didn't make the jump sooner. That's the feeling you get on the 808's compared to a basic wheel.

WHILE YOU MAY NOT NOTICE THE DIFFERENCE BETWEEN THE 2008 MODELS AND THE '09 VERSIONS, Paskins says that below the surface and internally is where the big changes have taken place. The first order of business was the hub. While a complete overhaul wasn't necessary, the Zipp engineers and designers simply improved upon what they had already. As someone who is all thumbs when it comes to hub maintenance, it's a snap to take apart, and more importantly, to put back together! The hub is handmade in Indiana with the only exception being the steel bearings, which are made in Switzerland. Zipp chooses steel for the bearing because theirs are two-and-a-half times rounder than most in the industry. You can get ceramic bearings through the high-end ZedTech program. One thing you should note about bearings is that it's not necessarily the material itself that makes a difference, but instead the roundness. Years ago it was assumed that ceramic was a rounder bearing, but today you will find ceramic bearings that are less round than the steel models Zipp incorporates. Just because they are ceramic doesn't mean they are better.

The refined hub

The new design goes across all models except for the Team Issue, which is an aluminum training wheel and the disc wheels. The rear hub is called the 188 (its weight in grams) and has a few key features like the adjustable pre-load which prevents the user from overloading the bearing. At the same time, if you choose to remove the play in the hub you can by tightening down a nut. To set up the hub correctly you just loosen the nut with a 2mm Allen key. So you don't overload the bearing, you screw it down until it makes contact with the bearing and then you back it off slightly about 1/8 of a turn, and then you tighten the nut down. Then when you put the wheel on the quick release, which adds significant pressure, you will not overload the bearing. The old hubs had a bit of play, which is fine because it means the bearing will flow freely, but the option to adjust is a nifty touch. The other feature is the new a 17mm proprietary Alcoa aluminum axle, which is on the order of a mountain bike axle! It gives a stiffer ride and more energy transfer and allows Zipp to use

a larger bearing that results in a greater capability to handle more load. One of the big changes is that each pawl has its own independent spring. Typically a hub has one spring that goes around the entire free hub body. The advantage to this is that if one does break, you can still get home. The pawls are extremely hard so when it engages in the ratchet ring, it will withstand the force. They also added a number of contact seals which covers the bearing making the hub basically waterproof, which is the biggest demon for all hubs. An interesting little fact is that some professional racers will take the contact seal out on race day and gain about 1-2 watts. 'Cross racers and people who live in harsh conditions can beat the hell out of these hubs including powerwashing and washing parts with diesel fuel! Zipp claims this new hub is essentially bomb proof. The flanges are higher and the driveside is





random bit.....

The hubs are made in Mooresville, Indiana by a company who used to make precision medical instruments. They have since gotten out of that business and build the Zipp hubs almost exclusively. What does this mean? Precision. Indiana has plenty of machine shops that can do precise work like this since they have so many medical firms. They simply retool and adapt the process for a different piece of equipment such as road hubs.



now radially laced, which allowed them to move the hub out slightly making for more balanced and stiffer spoke tensions across the wheel resulting in a more rigid, compliant and better built wheel. Other touches include laser etching each hub including a serial number which aids in service tracking. You can imagine Zipp has a database chock full of such numbers that they can refer to in the case of a repair. The front hub is called the 88 and applies the same principles as the rear in terms of loading the bearing. The nut also has an aerodynamic benefit. The aero shape takes the drag down to the equivalent of a 13mm axle. A clever touch since every millisecond counts! Benefits from all of these seemingly small improvements include a 20 percent stiffer hub, the durability aspect will take a bit of time to fully understand, but they believe that it will withstand the rigors of ProTour, cyclocross and everyday "Joe" much better than the previous version(s). Rider weight is not much of an issue with the high flange and it depends mostly on what type of rider you are. If you are a high-torque, heavier rider, then you may want to bump up the spoke count to accommodate for that. Guys as big as the now-retired Magnus Backstedt will ride this hub on the standard 404 wheel.

Rim design

The 808 along with the 404 have a completely redesigned rim shape. It's hard to tell but the deal is that the rim has essentially five curves. You won't be able to see it with your eye, but you can see the results in the wind tunnel. Some of the curvature in the 808 has been slightly changed which resulted in an advantage of nine seconds over 40 kilometers compared to the previous 808. The dimples are the third generation and the new rim has more of them. The story with the dimples is that by creating a greater amount of turbulence in the boundary area of air it allows the air to stick to the rim more so than without dimples. This reduces drag and improves speed. The concept is similar to that of a golf ball.

Wrapping the wheel

Zipp has been producing tires for a couple years



now called the Tangente which is based off the Vittoria Corsa CX. It's a 21mm racer with 290tpi making for a silky smooth and supple tire.

Other nuggets of knowledge

Carbon Bridge was introduced a couple years back across the entire tubular line. It's a Kevlar stitching or helix that is around the entire outside diameter of the rim (the braking surface) and results in increased impact resistance for all of the rims. This came about from input and impact from Team CSC (now Saxo Bank). They needed a more indestructible rim specifically for the Classics like Roubaix and Flanders. Zipp had all kinds of things they wanted to try, so they loaded up several boxes of wheels and headed over to Europe, specifically the Ardennes and let the boys of CSC try and break everything they could. What came out of it is the Carbon Bridge technology. The minimum impact resistance improvement was 20 percent, which was on the 202 model. The other wheels saw an even greater gain. All this resulted in fewer broken rims throughout the season.

There are essentially six components (pieces) to a typical Zipp wheel. They, of course, do not disclose details like how many layers are used and at what angles, as it's the heart of their technology.

When you compare the 808 to a traditional aluminum box-section rim and put Cancellara on a bike at 300 watts and then on the 808 going the same distance at the same speed Zipp estimates that the 808 is 81 seconds faster over 40 kilometers. Multiply that by five for a Grand Tour stage and time and watts savings is pretty significant. The 404 model saves about 71 seconds over that same distance (40km).

The question of weight came up with the Garmin-Slipstream guys, especially with the deep-sectioned wheels. The 808 and 404 that are predominately used are not that heavy and weight really doesn't matter unless you are at grades of eight percent or more for an extended period of time. So the common misconception that a deeper wheel like the 404 is not ideal for a climbing stage is a bit inaccurate given that you can save a bit on the aerodynamics compared to the 202. It's a "Catch-22" really because when you are trying to decide on lightweight versus aerodynamics, the natural inclination is to side with lighter weight, but in truth it seems that aerodynamics will save you more time and energy.

The Saxo Bank guys have migrated toward a combination of an 808 rear and 404 front because it provides a mix of lightweight, aerodynamics and handling characteristics. The

404 wheel had the same changes made to it as the 808 and saw a net improvement of nine seconds over 40km. All the work for the 808 and 404 were based on the development of the 1080 and the Sub-9 disc wheel. The Sub-9 achieves negative drag. The hundreds of hours of work on the 1080 and Sub-9 helped refine the 808 and 404.

What is ZedTech?

It started as the Z Series and is now called ZedTech. They have stepped it up considerably and have created an area that is full customization including the hub which is based off the aforementioned 188, the ZedTech version has dimples resulting in a savings of a couple watts. You can get the ceramic bearing upgrade, custom rim laminate like the SL which is a bit lighter than the standard 404 tubular, and you can get a stiffer laminate for the Clydesdale type of rider. You can also choose from a variety of different flange cap, nut, and spoke nipple colors. For the decals you can choose from any Pantone color and each letter can be a different color including mirrored finishes and super light labels as in weight! Full customization is nothing new as Trek, Serotta, Lynskey and others do similar programs with paint. It's a clever way to put your own stamp on a set of wheels. The cost is pretty significant and depends on the options. The nifty online tool keeps track of the price in a frame on the right so you'll see just how much of your child's college fund you will be spending. [R]

Check out: zipp.com and zipp.com/zedtech



four.one.one on the eight.zero.eight

Zipp 808 tubular wheelset specifications.

Aero rim width (F/R)..... 26.53mm
Rim depth (F/R)..... 81mm
Weight (F/R)..... 672g/790g
Price (tubular or clincher wheelset).....\$2500