An Incredible Accomplishment for the Cycling Industry!

– and an Experimental ‘B’ Standard Delay –

By Morgan Nicol of Challenge Handmade Tires

A little over two and half years ago an elite group of wheel and tire companies agreed that the cycling industry was in an intolerable position: losing consumers who were periodically suffering injury from tires blowing off rims while bike tire companies were suffering losses after costly lawsuits. As a result of the lawsuits and to protect our consumers, tire companies responded by reducing the bead seat diameters slightly to make sure they did not blow off. They had no choice because the international standards placed 100 percent of the burden on them to fit the tires to the rims. The problem was that the international standards were sadly outdated.

As a consequence, far more frequently than blow-offs, our customers were suffering the inability or extreme difficulty to mount tires. Bike companies had tires mounted by machine in Asia that were impossible to remove and fix when they had flats out in the countryside. Cyclists broke tire levers and sometimes could not even wedge them between tires and rims. Bike companies and shops were getting frustrated and cycling was losing consumers who flipped over to other sports or worse, sitting on their computers, because they did not want to be left out in the cold, wet and/or dark roadside or trailside.

On July 8, 2016, technical representatives from wheel companies Shimano, SRAM/Zipp, DT Swiss, Campagnolo, Reynolds, Trek and Mavic/ENVE joined tire companies Continental, Michelin, Kenda, Mavic, Trek (again) and Challenge in the ETRTO office in Brussels, Belgium, to address this major problem facing the industry. Representatives of ISO were on the speakerphone in the center of the table. All parties agreed that over the previous 10 years the bike industry was innovating far faster than industry standards were being updated. While the innovation part was fine (even wonderful!), the lack of updated standards was a disaster holding back our ultimate goal of keeping our elegant, 150 year-old, two-wheeled machines safely moving our customers and growing our base.

Companies agreed that beginning around 2008 the industry started evolving wheel and tire designs dramatically. We were simultaneously launching three massive changes:

1. Evolving tubeless tire technology from MTB into high-pressure road, TT, tri and track applications;
2. Building and promoting wider rims, mostly for aerodynamic purposes but ultimately also to support the tubeless road evolution without consideration of current rim/tire width standards. Because a tubeless system requires two well-defined shelves for seating beads

and a wider center channel, these requirements cannot be built into old 13-15mm or barely even 17mm rims; and, last but not least:

3. Building carbon fiber rims that were pretty simple, durable and successful for tubular use but ultimately were quite a challenge for clincher and tubeless applications.

Addressing tubeless systems, wider rims and carbon fiber innovations at the same time would stress any bureaucratic organization but our industry was not even addressing the problem.

The ETRTO (European Tire and Rim Technical Organization) governs ALL wheeled vehicles worldwide – cars, trucks, buses, motorcycles, airplanes, tractors, road graders, lawn mowers and, yes, bicycles. Updated ETRTO standards are issued every year in a 1½-inch thick book where in 2010 cycling comprised three pages! By 2016 the ETRTO standards for cycling had not been updated since 2010 and that standard addressed only clincher wheels and tires and quite poorly at that. There was no mention of tubeless tires or wheels for MTB or road (or even 130-year-old tubulars for that matter).

ISO (International Standards Organization) governs standards for everything – all types of machines, systems and appliances including bicycles. ISO standards are updated every four years. Amazingly, in 2015 ISO had just finished the major accomplishment of integrating bicycle standards from Japan (JIS), USA (CPSC and ASTM), Europe (CEN), and Germany (DIN that was still being integrated into CEN standards) and a bunch of other standards from other countries into a single set of global standards under ISO 4210. The only problem with ISO 4210 is that it only governs testing standards for individual parts of the bicycle; it does not address any component interactions like a handlebar and stem, a saddle and seat post or a rim and tire.

How do we set a global standard for bicycle rims and tires when the Americans were saying “We don’t need to follow ETRTO because their first name is European” – even though ETRTO has been accepted as the global standard for your car and all those other vehicles discussed above since the 1970s – and ISO had not even started addressing component interactions? Where do we begin? How do we get started when the train is running away from us and threatening the bike brands, shops and consumers on which we depend?

The solution was a bureaucratic success story that unfolded in the first 30 minutes of that first meeting called by the ETRTO and ISO together at the request of the WFSGI (World Federation of Sporting Goods Industries). For those not familiar, the WFSGI is a NGO founded by companies like Nike, adidas, Mizuno, and later joined by the bike industry (and other sports industries), that negotiates with national and international federations (like our UCI), FIFA and the IOC. Our industry pushed the right buttons with the WFSGI and the WFSGI pulled ISO and ETRTO together.

Stunningly the ETRTO and ISO agreed immediately (in the first 5 minutes) and emphatically that the ETRTO would guide our industry group through the process of upgrading the rim and tire standards, would update them annually as the new ETRTO standard and at the end of four years the ETRTO standard would roll-over into the new, updated ISO 5775 standard.* There would be one global standard for everyone to follow and the industry would be in charge of insuring customer safety, guiding our innovation and protecting our company's futures.

After another 15 minutes the group agreed unanimously that we needed:
1. an updated clincher standard;
2. a tubeless standard; and finally
3. a tubular standard.

We celebrated for 5 minutes and then went to work for the next 7 hours educating ourselves on "standards protocol" while clarifying and re-writing the existing standard before assigning homework for various representatives.

Stefan Breggren from Trek, for example, was tasked with bringing an update to the ASTM meeting held Sept. 20, 2016 in Las Vegas, just before the Interbike show. There Stefan updated the group and then took feedback from mostly American companies like SRAM, Stan's and American Classic but also Taiwan companies like Maxxis, Kenda and Hwa Fong who cannot join ISO or ETRTO due to China blocking Taiwan companies from joining international organizations.

Having received Stefan's invitation to attend this ASTM meeting I was surprised that there was not the spirit of cooperation we found in Brussels 10 weeks before. In fact, Stan himself stating that his tubeless standard was the logical standard and that there was no need for a global standard that would block innovation overwhelmed the discussion. I have kick myself to this day for not speaking up, even as an invited guest, to question this failure to look at the bigger picture – the effects of a lack of standards on our customers.

Flash forward to Sept. 7, 2018 and we arrive at the fifth ETRTO / ISO 5775 TC31 SC10 WG16 meeting in Brussels after two ETRTO annual updates, two years of national meetings and 54 proposals, written, evaluated, voted on and implemented into 30 pages of highly evolved (if not yet perfect) new ETRTO standard. Finally, 2019 is the year (we thought) that the ETRTO standard would roll into the new ISO 5775 standard and the world would have a consistent production goal to protect our customers.

Here at Challenge we took the leap of faith. We totally re-engineered and re-sized and shaped all our tire beads to precisely fit rims with the now defined and placed bead seat diameter, the sufficiently wide and deep center channels and the walls with and without clearly defined hooks both clinchers and tubeless systems required. Side notes

had been clarified and amplified and responsibilities placed: for example it is the rim company's responsibility to supply and/or precisely define the rim tape type and model or thickness, width, compliance and surface finish and fit them within the standard rim drawing requirements.

The wheel companies have agreed on all these specifications they can now use to produce quality, high performance rims in alloy or carbon fiber or other materials. A number of big, high quality rim companies re-designed their entire lines to follow these new standards emerging from the fog.

Tire companies, Challenge included, can now produce tires that can be mounted with your fingers. They can be inflated to extremely high pressures like 20+ bar (300+ psi) for our track tires on steel rims precisely machined to standard in our factory. And we can now remove them, usually by hand, in case of puncture without fear of them blowing off and causing a crash.

We have returned tire fit to what it was for at least 40 years prior to 2008. These are the clear, precise standards we needed, the new standards we now have ready and this is a critical success for our industry.

Also fortunately for the industry in our September 2018 meeting, Michael Bush from Stan's No Tubes arrived for the first time to make a proposal for a second, very interesting, innovative "B" standard. After addressing all of the critical details from our minutes by 2 p.m. so we could forward the new ETRTO and ISO standards by the end of 2018 to become the new 2019 standards, we had time to hear Michael's proposal.

The Stan's proposal was first delivered with only vague details, a couple of sonogram visuals of tire and rim fit and no documentation so Michael was requested to present a more detailed written proposal no later than Oct. 31, 2018, for our review. The ETRTO convenor and I both cautioned that this was a very late date for a new proposal considering our publication deadlines were looming. Since it was our understanding that critical dimensions to tire fit – specifically the bead seat diameter, channel width and depth and wall height – would all seem to change with this proposal, we worried it would probably not be possible to study, clarify, test, debate and properly document this new proposal, especially for high-pressure road and track applications, by our 2018 deadline.

I visited the Sept. 17 ASTM meeting in Reno at the Interbike Show and Michael again confirmed there was a proposal being created but offered no new documentation for review. Only on Nov. 6, 2018, did we receive the written proposal for this new Stan's standard.

During our Feb. 19, 2019, meeting Stan's invested to travel to Brussels to address the group with a modified and clarified proposal. That is not cheap! Stan's made clear that there are five to 10 other companies currently operating in their proposed B standard parameters. The ETRTO/ISO group showed respect by investing 3 1/2 hours of discussion to respond to Stan's that while we feel the standard may have merit and its connection to potential innovation make it quite valuable, it is still not ready.

As stated above, because it is now even more clear that critical dimensions to tire fit – specifically the bead seat diameter, channel width and depth and wall height – all change with Stan's B proposal, it would not be possible for tire companies to accept liability for fit while studying, clarifying, testing, debating and properly documenting this new proposal. It is also seems not fair to hold off publishing the standard improvements agreed by the larger group. Furthermore the proposal clearly states that samples with varying bead bump height and angles of the bead seat are still being prepared for testing. What to do?

It is clear tire companies cannot test and assure that tires based on a 622+–0.5mm bead seat and other agreed wall height and channel width and depth parameters, especially for high-pressure applications like Road and Track, can be mounted comfortably and still safely maintain proper tire fit with Stan's 623 +–0.3mm BSD design parameters without high risk of failure. Therefore it seems it is the feeling of most of the group to recommend that this year's ETRTO and subsequent ISO updates proceed.

It was recommended that the Stan's "B" Standard Proposal be accepted as an experimental standard for testing as part of next year's 2020 ETRTO update. This was the same system the French used for 15 years to perfect the UST tubeless standard that has slowly morphed into the current tubeless standard.

• Actually I now understand from our Feb. 19, 2019, meeting that ISO originally agreed to wave their normal 4-year update period and leave the ISO standard open to allow ETRTO to work methodically through this complicated standard creation process. While ISO reiterated this original agreement they also said ETRTO had made such progress and had agreement from such a broad cross section of the industry that they could be willing to call a vote to proceed to updating ISO 5775-1&2 this calendar year.

Sidebar: Other fascinating things I learned at ETRTO & ISO Meetings:
1. ETRTO has governed global wheel and tire standards for every type of vehicle (cars, motorcycles, trucks, buses, airplanes, lawnmowers and even bicycles) since the mid-1970's.
2. ISO bicycle standards to date have only related to single components, never component interactions. The new wheel and tire

standard will be the first standard to define component interactions on a bicycle.

3. The ETRTO (and soon new ISO 5775) standards are written to precisely specify the rim design (within the wheel) and the tire companies are then required to produce tires to fit the rims.

4. Bicycle wheels are the only wheels in the ETRTO manual that normally require a rim strip or tape. It is the rim company's responsibility to supply and/or precisely define the rim tape brand and model or thickness, width, compliance and surface finish and include them within the rim drawing requirements.

5. Product liability, especially in Europe, holds the rims totally accountable if they do not precisely follow the ETRTO standard. If the rims follow the standard, the tire company is held liable.

6. Bicycle tire companies are the biggest companies in the bike business (yes, even bigger than Shimano) and therefore carry the largest liabilities if their products fail.

7. Most bicycle tire companies (especially those big ones) are members of ETRTO due to their production of car, motorcycle, truck, bus and other motorized vehicle tires while bicycles are a very small but growing concern.

8. Most (all?) bicycle rim companies are exclusively involved in bicycles and therefore are normally involved in ISO, not ETRTO.

9. Most of those huge bicycle tire companies are pushing tubeless technologies for bicycles because that is the technology they use for all of the "other" 99% of tires they produce.

10. Bicycle tires are the only tires in the ETRTO manual that are required to be mounted and removed by hand (so they can be changed out in the countryside) AND bike tires run on the highest pressures.