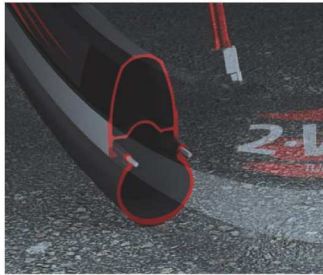


OUR R&D DEPARTMENT IT'S THE PRIDE AND JOY OF OUR COMPANY.
INSIDE THIS UNIT, HIGHLY SOPHISTICATED PRODUCTS ARE DESIGNED,
TESTED, AND DEVELOPED THAT EMBODY THE DNA OF FULCRUM.
INSIDE THE R&D DEPARTMENT THE OBJECTIVE IS TO CONTINUOUSLY
INNOVATE IN ORDER TO IMPROVE THE CYCLING EXPERIENCE FINDING
THE RIGHT BALANCE BETWEEN EQUALLY IMPORTANT FACTORS:
PERFORMANCE, RELIABILITY, QUALITY, DESIGN, AND SAFETY.

TECHNOLOGIES



▶ 2-WAY FIT™



2-Way Fit™ profile for tubeless and clincher

Tubeless technology was first used by the auto industry, then by motorcycles and now has reached the cycling industry.

After its debut with mountain bikes the moment has come to "put it on the road", and that's what we propose to do. We have developed our 2-Way Fit™ technology to ensure the perfect compatibility of our tubeless rims with normal clincher types and tubes. 2-Way Fit™ wheels are perfectly multipurpose for tackling every situation.

Thanks to a special impression in the valve area, the tubes are fitted with the maximum precision while keeping the tube perfectly stable inside the tyre. Housing the valve for tubeless tyres is also risk-free, with the unquestionable advantage that there are never any air infiltrations caused by non-ideal positioning when fitting.

The advantages are indisputable: our tests have highlighted an unique increase in smoothness. Because there is no tube, the friction caused by rubbing against the tyre is eliminated, while the perfect adherence of the tyre to the rim prevents the dispersion of energy.

Tubeless tyres do not suffer from sudden deflation when punctured which is a great advantage in safety terms. There is also no risk of snake bites as there is no tube to rupture.

You may ask, "what do I do if I get a flat with a tubeless tire?" Not to worry! With Fulcrum 2-way Fit™ you must simply remove the tubeless valve and use a standard inner tube to get you back home.



▶ ULTRA-FIT™



Ultra-Fit™ Tubeless

Here's the interface between the tubeless tyre and the rim. The form we have studied for our rims with Ultra-Fit™ Tubeless technology means that the sides of the tyre mate perfectly with the shoulders of the rim when it is fitted. The result is exceptionally smooth: for whizzing speedily without tubes!

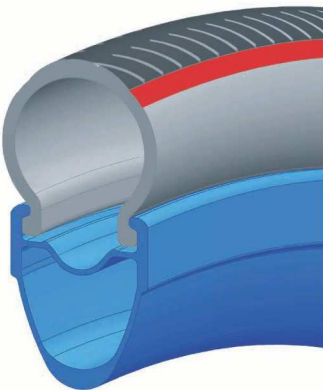
By eliminating every possible movement between the rim and tubeless tyres, all energy dispersion is also eliminated. The Ultra-Fit™ Tubeless wheels well exceed any other wheel fitted with traditional tyres in our tests.

Installing a tubeless tyre with the Ultra-Fit™ Tubeless system is as easy as with traditional tires. Two special grooves on the inside of the rim keep the tyre perfectly in position.

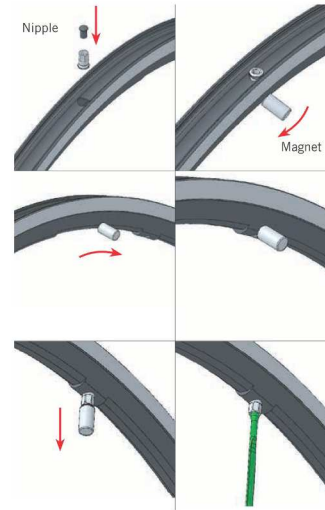
The exclusive shape of the rim was developed in the Fulcrum® Research & Development department. The rim profile coincides exactly with the negative of the tubeless profile.

Thanks to this feature, rims with the Ultra-Fit™ profile have some important advantages:

- Less friction between rim and tubeless tyre
- Lower rolling resistance
- Easy mounting of the tubeless tyre
- Maximum safety in case of flat tyre



▶ MoMag™



Mounting Magnet

What is MoMag™?
A magnet and lots of ingenuity.

This was what led to the patent for the well-tested "Mounting Magnet" system, or MoMag™. How does it work? The nipples, once inserted inside the rim via the valve hole, are "guided" to the point of connection with the spoke by means of the magnet. This simple but ingenious system makes it possible to have a wheel without holes on the upper bridge, but with spokes tensioned by traditional nipples!

Advantages

A rim with no spoke holes on the tire side means that the rim is completely uniform and thus eliminating high stress areas or weaker points. It also eliminates the need for rim tape as the sharp edges of the spoke hole are no longer a threat. No rim tape also means less weight.

The advantages are immediately clear

- greater rim lifetime
- greater resistance to fatigue
- the possibility to give the spokes greater tension
- greater stiffness

There are countless performance advantages associated with this technology but not to be overlooked are also the ease of maintenance and spoke replacement.

▶ RDB™ Rim Dynamic Balance

Dynamic Balance™ aluminium rims

The concept is simple and elegant: balance the weight of the gasket, with an item of similar weight placed on the exact opposite side. For top models, this is obtained by a special operation on the section of the rim opposite the rim joint. For entry-level models, Dynamic Balance™ is obtained by using two oversized spokes in the section opposite the joint. The result is a wheel with perfectly balanced rotational dynamics.

Rim Dynamic Balance™ carbon wheels

For carbon wheels the principle is the same, but applied using a different technology. When making carbon rims, the pieces of carbon fabric are aligned in such a manner that the resulting rim is always balanced.



The weight of the rim joint is balanced at the opposed end by the unfilled valve seat. The weight is thereby balanced and the rim is stable and balanced even at high speeds.

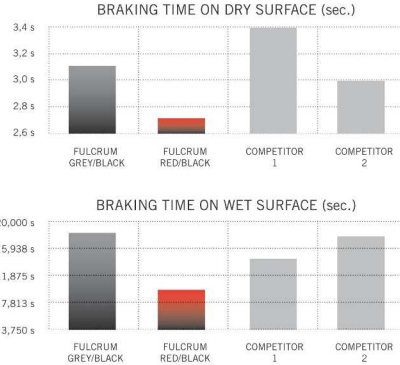
The principle is always the same: balance the weight at every point of the rim. In this case the rim joint is balanced by 2 spokes with a different weight than the rest.

Thanks to a particular study on the positioning of the carbon skins, the rim is balanced at every point.

▶ BRAKE PADS



Our engineers dedicate countless hours working on improving every last detail of our wheels and a large part of wheel performance is measured by its stopping distance. To maximize braking performance the Fulcrum R&D department has developed internally brake pads made specifically for our carbon wheels. The special blend that resulted from seemingly unending rounds of testing increases brake performance on both dry and wet surfaces without increasing the war and tear on the pad or the braking surface of the rim. These brake pads are to be used also with Racing Zero Nite wheels.



▶ Anti-Rotation System



This new system raises the concept of spoking to new heights of performance. The Fulcrum® engineers have redesigned the spokes and the hub housings to create a solid and unmoveable whole. The result is that the spokes:

- a) will never lose their initial tension, thus keeping the wheel perfectly reactive and centred, and
- b) will remain in the position that was found in wind tunnel tests to ensure the best aerodynamic penetration possible.

▶ 2:1 Two-to-One™ Spoke Ratio



When you push on the pedals, the rotational force on the sprocket induces a slackening of the freewheel spokes with a consequent loss of rim tension. This results in undesirable flex of the whole wheel and an unavoidable loss of energy. Fulcrum® has solved this classic cycling problem with its 2:1 Two-to-One™ Spoke Ratio patent, by doubling the spokes in the critical zones.

As a result there are two spokes which carry out the function of one, slackening and torsion are limited and the transfer of the athlete's power is much more effective. Also, thanks to this system, spoke tensions are balanced more evenly between drive and non-drive sides and the fatigue life of the rim, hub and spokes is lengthened.

▶ CULT™



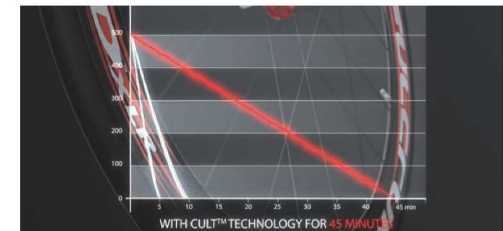
CERAMIC ULTIMATE LEVEL TECHNOLOGY
MAXIMUM EFFICIENCY FOR MAXIMUM PERFORMANCE

Ceramic Ultimate Level Technology™

There are wheels and there are wheels made with CULT™ technology. Wheels will get you to where you are going with varying levels of fatigue depending on the make and model. Wheels made with CULT™ technology will get you to the finish line faster, with less fatigue and will last considerably longer. Those looking for the fastest, most efficient and durable wheels need look no further as they may simply choose the technology that even the best pro-tour riders have come to demand: CULT™.

You can rest assured that if your wheels are made with CULT™ technology you are sitting on the fastest and most efficient wheels available. So superior is the CULT bearing technology that laboratory tests prove that hubs equipped with CULT™ technology run 9 times longer than standard bearings. Other tests involve spinning the wheel equipped with CULT™ technology at 500RPM and then allowing it to decelerate. The CULT™ equipped wheel continues to spin for a full 45 minutes.

Being able to roll as friction free as possible is of utmost importance as it is one key element in reducing fatigue and increasing efficiency. In other words, smoother and more efficient bearings allow you to ride faster using less energy. CULT™ technology allows the rider to spend less energy on overcoming friction and enabling him or her to be fresher at critical points in the race. At similar power output, CULT™ bearings allow the rider to maintain higher average speeds, thus translating into crucial time savings.



▶ USB™



Ultra Smooth Bearings™

Fulcrum® has a long-standing reputation for the extremely high performance of its hubs in terms of smoothness and reliability.

In fact, we develop each and every hub in house and place obsessive care into the most minute detail.

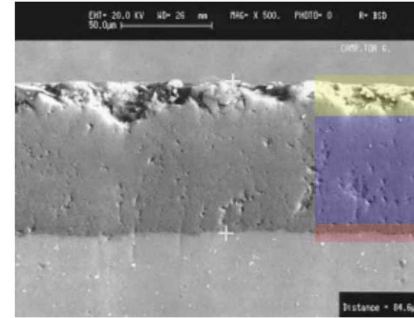
With this work ethic and attention to detail in mind we choose to employ USB™ ceramic bearings to further reduce our wheels' rolling resistance, weight and need for maintenance.

Comparative tests have shown that USB™ bearings are 50% smoother than standard bearings.

Now improving your performance during the race or simply going for a ride with your friends will be easier.



▶ Plasma Electrolytic Oxidation



The Plasma Electrolytic Oxidation treatment is a process made thanks to electrical discharges that take advantage of heavy materials - free electrolytes. This process is an advanced oxidation process of light alloys of aluminum, magnesium and titanium.

This special project was developed a few decades ago in the Russian laboratories to improve characteristics of the lightweight materials used in the field of space and military.

The Plasma Electrolytic Oxidation process gives the alloy surface very special characteristics regarding hardness and wear resistance. This is possible thanks to a very fine and compact matrix of alpha and microcrystalline gamma alumina and amorphous alumina embedded on the surface.

Wheels treated with Plasma Electrolytic Oxidations take a new really engaging total black look, also interesting for the excellent wear resistance thanks to the high hardness of the layer. Fulcrum R&D department has chosen to use this treatment also on the aluminum braking surface, developing a new design created by turning that allows superior braking efficiency.

Brake pads specified for carbon rims should be used with this special finishing.



▶ OVERSIZE AXLE™



The hubs designed for Fulcrum® wheels employ a generously dimensioned design for both the central body and for the rotation axis. The diameter of the latter, 20 mm for all the models with disc brakes, guarantees high resistance to transverse and torsional stresses. A contribution is also made to this result by the mechanical architecture of the hub which, in the AFS™ version, is provided with bearings with a double ball-bearing race positioned outside the flange, so that it is aligned with the disc on the respective side.



▶ AFS AXLE SYSTEM™

The Axial Fixing System™ is the solution developed by Fulcrum® to fix the disc brake to the hub.

The constraint granted by the butt area of the release mechanism, greater than in familiar standard ones, makes it possible to obtain greater structural rigidity and therefore more precise and powerful braking.

The availability of the International Standard option ensures full compatibility of Fulcrum® wheels even with the most widespread braking systems that use this assembly plan.



▶ ONE HUB FITS ALL STANDARDS

A solution that allows the wheels to adapt to different standards on the market in a fast and simple way. Different adapters can be fitted in a few easy steps to allow the wheel to be fitted to any frame standard.



▶ QUICK RELEASE

What is the Fulcrum® Quick Release?



The Fulcrum® Quick Release is not simply a wheel locking/release system. First and foremost, it is the component that guarantees the cyclist's safety, especially at high speeds, such as in road races. The Fulcrum® Quick Release project started with a very clear objective: the maximum performance in terms of easy assembly/disassembly, weight, smoothness of the wheel, but without compromising safety in any way.

The patented Fulcrum® mechanism is the one that best meets these needs. The lever is positioned centrally with respect to the axis of the hub axle, i.e. in the best position to put both ends of the axle in traction without differences in load between the sides. The axle is in the form of a cam and applies the closure traction on the axis of the quick release.

Advantages

Thanks to the cam axle closure, it is simple and intuitive to understand the force to be applied for correctly closing the quick release and, even more importantly, the cam creates a mechanical impediment to the opening of the release, making it extremely safe during road use.

The fork positioned symmetrically with respect to the sides of the lever and centrally with respect to the axis of the skewer, enables an even distribution of the loads and forces at each point of the skewer, thus avoiding critical breakage points and at the same perfect closure the fork of the frame and the wheel.

The symmetry of the lever and the special shape of the cam make locking and releasing the Fulcrum® wheel extremely easy, fluid, and safe. The new aerodynamic form, moreover, considerably improves the aerodynamic coefficient of the range of wheels dedicated to time trial disciplines.



▶ F.I.C. FULCRUM® IDENTIFICATION CARD

Since its inception Fulcrum® has been dedicated to researching, developing, designing, testing, producing and perfecting wheels that live up to the prestigious red "F" that symbolizes the quality standard required of all products that leave our factory.

With an extensive R&D department, Fulcrum® takes pride in producing the most advanced, reliable and highest performing products possible. The studies and development behind all of our products is extensive in order to ensure the maximum in performance and product integrity. To guarantee the same quality and performance in each and every product that leaves the factory a meticulous quality control system has been put in place. Every single product must undergo a series of intense and strict testing at every stage in the production process as well as a post production test in order to confirm that every wheel, spoke and quick release is in line with our stringent quality standards.

FATIGUE TEST

before the manufacturing stage, each wheel and each of its components are subjected to long and very challenging tests that ensure the durability and performance over time.

CRASH TEST

Simulates the impact of the wheels with possible obstacles. The Fulcrum® tests have successfully passed the tests required by UCI standards.

ENVIRONMENT TEST

exposure to UVA and UVB rays, salt attack and exposure to moisture: these are the tests that all Fulcrum® wheels must pass to ensure maximum performance and reliability over time.

100% MANUALLY ASSEMBLED AND ELECTRONICALLY CHECKED

The pre-emptive tests mentioned above may be sufficient. But not for Fulcrum® who wants to ensure the highest quality of each individual wheel, checking the parameters at the end of the production process. This is why Fulcrum® made a clear and conscious choice: to assemble each wheel manually and submit it to a series of final checks that guarantee their quality.

The only way to ensure that each and every wheel that bears the Fulcrum name lives up to our quality standards is by using a completely manual assembly process by trained and specialized personnel. Once every product is produced it must then pass through both manual and digital inspections carried out by qualified Fulcrum® staff.

- Balancing: guarantees the absence of vibrations at fast speed.
- Lateral and radial control: guarantees the perfect alignment of the wheel to ensure the wheel is true from all angles.
- Camber: ensures the perfect symmetry of the wheels with the bicycle.
- Spokes tension: ensures optimal balance at every point of the wheel.
- Rolling torque of the hub: ensures a perfect adjustment of the hubs.

We must be sure that every wheel we produce is up to our standards, but you, the cyclist and consumer must also be sure. To further ensure the quality and integrity of each and every product we produce Fulcrum® implemented a program that began in 2012 which assigns every single wheel its own Identity Card. This identity card uniquely identifies each wheel and certifies that it has been manually assembled and has passed all tests and controls required by our strict protocol.



To find out our worldwide sales and service centers list, click on "Network" section on

www.fulcrumwheels.com

▶ HOLOGRAM & TRACEABILITY



Fulcrum® carbon fibre wheels are among the most highly sought-after components of their kind in the racing cycle world, and this inevitably attracts the attention of counterfeiters.

To defend its image and quality, and to protect the end customer, Fulcrum® applies a hologram decal to every wheel in its Racing Speed range to certify that it is an original Fulcrum® product.

Demanding proof that you have purchased an original Fulcrum® product is your right as a consumer, and also offers the peace of mind of knowing that you can make full use of the superlative performance these wheels were designed to deliver.

Proof of originality also certifies that the wheel was built to Fulcrum's stringent standards and has passed all of our quality control tests.

Please note that the manufacturer's guarantee and all the support services offered are only valid for original products.

One key factor behind Fulcrum® quality is the fact that each and every product that bears our name and leaves the factory is completely traceable. The traceability program gives advantages all around. First and foremost to our consumers as it proves to them that they have acquired an original product. Secondly it is also a quality control measure for after-sale issues. Should you have any problem whatsoever with your wheel Fulcrum can immediately identify the exact time at which any given product was produced in order to take measures to rectify any problem that may emerge. Fulcrum demands absolute perfection in order to pass it along to cycling consumers.



Fulcrum®, 2:1 Two-to-One™, Dynamic Balance™, Racing Torq™, Ultra Torque™, CULT™, Hollow Crank Technology™, 2-Way Fit™, Ultra-Fit™, MoMag™, Red Wind™, Racing Light™, Racing Speed™, Racing Chrono™, Red Carbon™, Red Metal™, Red Fire™, Red Zone™, Red Heat™, AFS™, HH™, Racing Zero Nite™, Red Power™ are registered Trademarks of Fulcrum Wheels S.r.l.
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