DOGMA F12
PINARELLO

WHITE PAPER

INDEX

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1. INTRODUCTION

a. PINARELLO

Cicli Pinarello S.R.L. is one of the most famous and winning bike manufacturers in the world. Founded in Treviso (Italy) in 1952 by Giovanni (Nani) Pinarello, it produces high end racing bikes. This name, Pinarello, recalls legendary victories of the greatest cyclists of all times: since 1975, the first victory in Giro d'Italia with Fausto Bertoglio, Pinarello has won all the most important races in the world, including Olympics, World Championships and Tour de France.
Pinarello has always been synonymous with innovation and performance. In every area and segment, the DNA Pinarello leads to research the technical solutions that best interpret the rider's needs. With this same philosophy, the project to create a new weapon for World Tour races was approached. It took almost 2 years of research and development, but PinaLab is proud to present our new project... the DOGMA F12.

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b. FROM TEAM SKY TO TEAM INEOS

Pinarello has been the main technical partner of Team Sky since its foundation in 2009. This partnership has seen the development of 8 different road bikes and 3 time trial bikes, that have been successfully used by the team to win races across the world.
This cooperation has allowed Pinarello to test the bikes in the most severe conditions and to get precious feedback to improve its products, making them the best performing and desirable road bicycles on the market.
In recent news, starting May 1st Ineos will take the place of Sky as main sponsor for the Team. The partnership and technical cooperation with Pinarello will continue forward without change, and we also expect it to be stronger in the future. Always focusing on creating products that can give the athletes the best possibility to win.
We are proud to announce that the first bicycle used by Team Ineos for its official debut will be the: Dogma

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c. DOGMA F8 AND DOGMA F10

Since May 2014, the year of introducing the Dogma F8, all Pinarello models identified by the initial “F” are recognized as the most famous and winning bikes in the world. Team Sky, riding the F8, won more than 90 races in 3 years and with the F10 has won 4 out of 6 Grand Tours in just 2 seasons. Everyone can still remember Chris Froome winning the Tour, Vuelta, and Giro all in a row between the 2017 and 2018 season.
All of these victories have been won on all types of routes: mountain, breakaway and sprint finish stages. This highlights the “all-round” characteristic of the fantastic Pinarello Dogma F8 and F10. The same characteristic has been used as the baseline to develop the new F12, with a certainty that the tradition of victories for the Dogma "F" family will continue.

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2. SUMMARY OF THE IMPROVEMENTS

a. TARGET

Having created two of the most successful bicycles in recent cycling history, Pinarello was able to draw on a very broad technical know-how to develop this new project. In fact, the Dogma F12 is the outcome of a complex study that merges Pinarello's leading structural and aerodynamic knowledge with an accurate investigation of rider needs to enhance their riding experience.
Riders needs are now distinctly different in comparison to previous years. We are facing a situation in which on one hand, there is the natural evolution of the cyclists needs towards disc brakes due to their safety and constant performance. On the other hand, there are those who still prefer a bicycle with traditional rim brakes due to weight savings.
While creating the Dogma F12 we decided to develop two different projects together, a version with disc brakes: the Dogma F12 Disk and one with traditional brakes: the Dogma F12. This way we were able to apply common improvements, but at the same time study specific and dedicated technical solutions for each model.
One of the main targets of the new Dogma F12 was also to maintain the "all-around" characteristic, which means a stiff and light bike, with excellent aerodynamic balance. A combination allowing the unique "Pinarello feeling", synonymous for agility and precision through every corner. The Dogma F12 is the result of the perfect tool to enhance the rider performance for every route.

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b. IMPROVING

Summarized, the improvements and results obtained through the development of the Dogma F12 are:

Aerodynamic:
- Cable routing integrations
- Integrated handlebar, 5% less drag
- Refined fork and frame, with a drag reduction of 7.3% compared to the F10
- Drag saving of 8 Watts at 40km/h compared to the F10

Structural:
- BB and chainstay reinforced. Allowing a stiffness increased of 10% compared to the F10
- Disk Version: reduced fork twisting during braking by 40%
- Rim Version: direct mount brakes
- Integrated handlebar weight reduced by 10.3% compared to Talon Aero
- Integrated handlebar stiffness increased by 8.6% compared to Talon Aero

Versatility:
- Complete integration for all groupsets (mechanical and electronical). No visible cables and no cable stoppers on the frame
- Versatile headset spacer that allows stem stack range of up to 40mm
- Compatible with non-integrated stem and handlebar.
- Tire clearance up to 28 mm

Geometries:
- 13 frame sizes for both model versions (Rim and Disk)
- Head tube stack reduced by 5mm for sizes 530 and up to meet the needs of the more sportive riders
- 16 integrated handlebar sizes

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3. AERODYNAMICS DESIGN

Aerodynamics is a complex area of study because of the interaction between the airflow with all bike components as well as the rider. The optimization of the parts done one by one could cause worsening of the overall performance because it does not consider the interaction between each of the parts. Because of this, Pinarello for years has used CFD (Computational Fluid Dynamics) technology for aerodynamic studies and development. This allows us to optimize every single frame component and provide proof of the improvement in a full model that includes human dummy.

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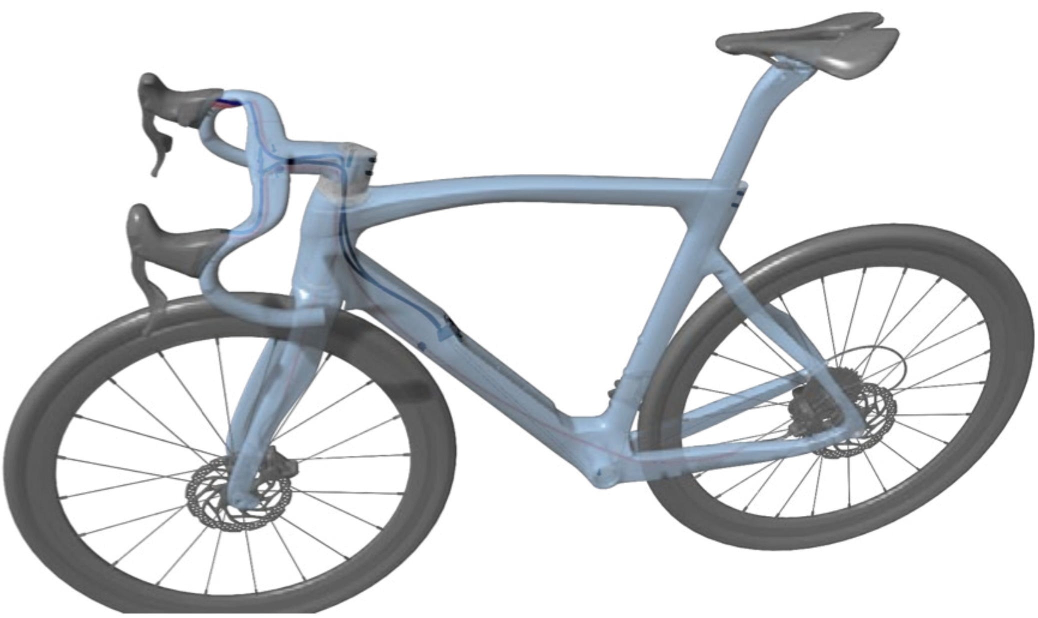
a. COMPLETE CABLE INTEGRATION

The aerodynamic analysis completed to develop the Bolide TT, Bolide HR and Dogma F10 was used as a baseline to improve aero performance of the Dogma F12. The fact that those bikes were considered the benchmark in aerodynamics and including the needed consideration for restrictive UCI rules, make the task of reducing drag far from simple. However, we know it is always possible find room for improvement and the PinaLab focused on the possibility of eliminating drag coming from external cables.
Strategizing how to hide cable housings into the bike frame is complicated in order to guarantee the primary function of the cables: ensuring the correct brake and shift functionality. In fact, a poor integration design can lead to extreme cable housing bends that reduce brake and shift quality. The PinaLab developed a specific handlebar and headset design that enables the correct cable functionality and allows integration of all possible brake & gear combinations (disc or rim; mechanical or electronical).
CFD analysis proves a reduction of 85% of cable drag. The remaining 15% is due to the short housing portions exposed externally on the frame. These are necessary for connections with the brake and disk.



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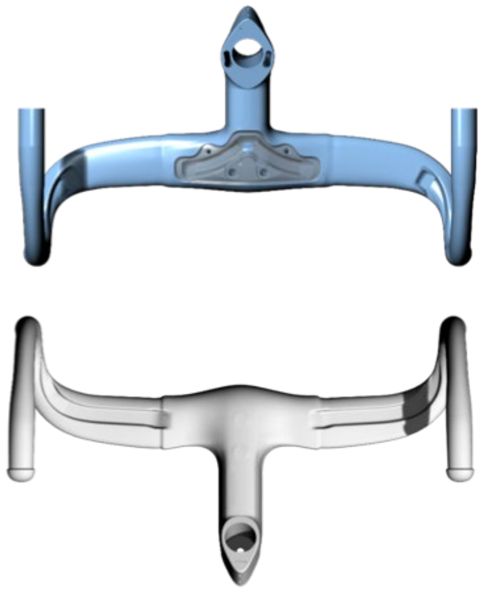
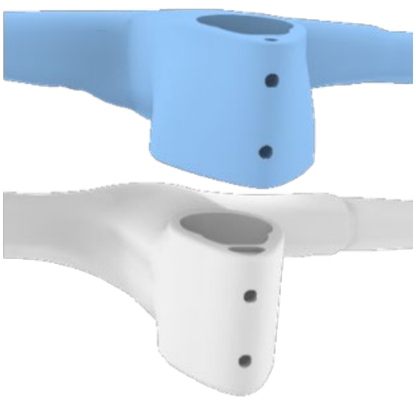
b. NEW HANDLEBAR: MOST TALON ULTRA

The frontal area of the handlebar is more than 20% of the total bikes frontal exposed surface, given its prominent position it constantly interacts with airflow. Since the first integrated Talon handlebar in 2015, Pinarello and Most understood the importance of an aero shaped handlebar to optimize the aerodynamics of the overall bike. The 2015 Talon was able to reduce the air drag by 28% versus a standard round bar and stem system. With the regular Pinarello product development mentality, the Talon Aero was introduced in 2017, where a deep aerodynamic study achieved a drag reduction by 2% compared to the first Talon in 2015.
The Talon Aero is now re-designed again with the clear goal to hide cables from airflow. Resulting in the new Talon Ultra.
The main handlebar geometries, (reach, drop) were maintained to guarantee the same rider position. The lower side of the handlebar is now completely re-developed to allow internal cable routing. The main visible difference is that the Talon Aero 2017 had clips to retains the cable, the new Talon Ultra has an integrated channel.

The rear part of the stem is also re-designed in the Talon Ultra. The handlebar must accommodate both the steering tube and the exit holes for the cables towards the brakes and the gearbox without compromise of performance. This led to a wider handlebar section which was harmonically shaped granting the best aerodynamic efficiency.





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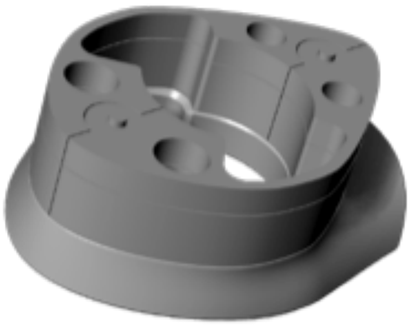
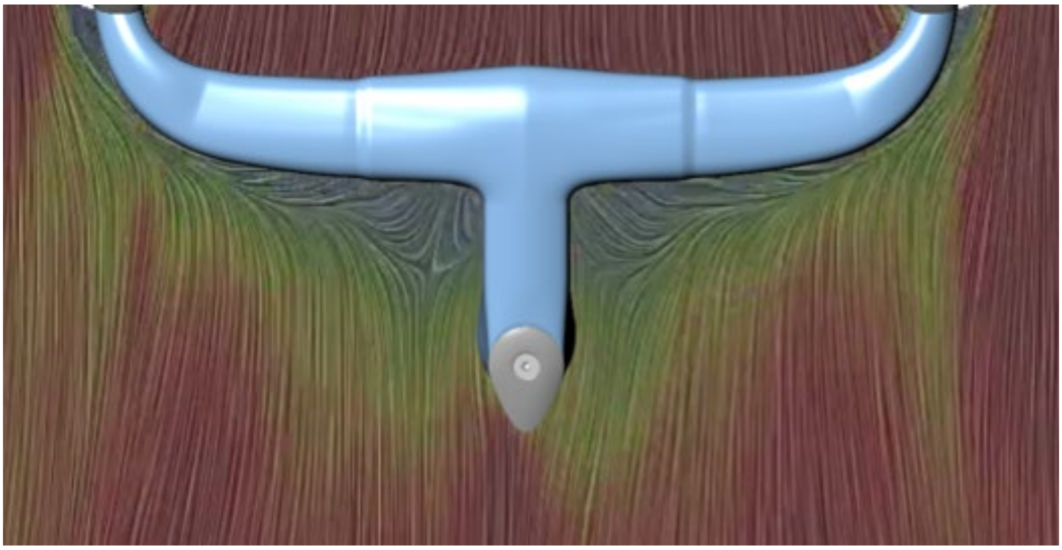
The headset spacers have been redeveloped as well with the dual purpose of uniformly connecting the new Talon Ultra to the frame and ensuring correct cable routing. This includes spacers that are designed with an appropriate aero shape to provide minimum possible drag.



All these refinements are necessary to fully integrate the cable routing, leading to an incredible aerodynamic result. CFD analysis prove that Talon Ultra has a drag value 5% lower than the Talon Aero. This huge improvement is the combination of the hidden cables and the updated handlebar aerodynamic shape.



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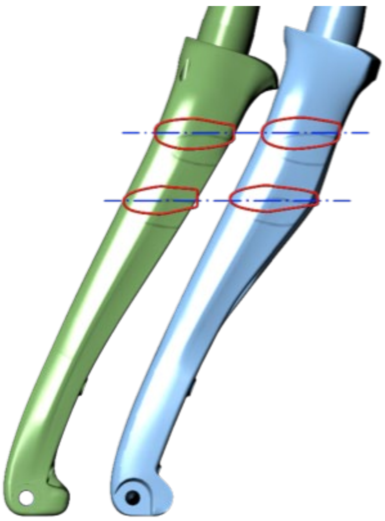
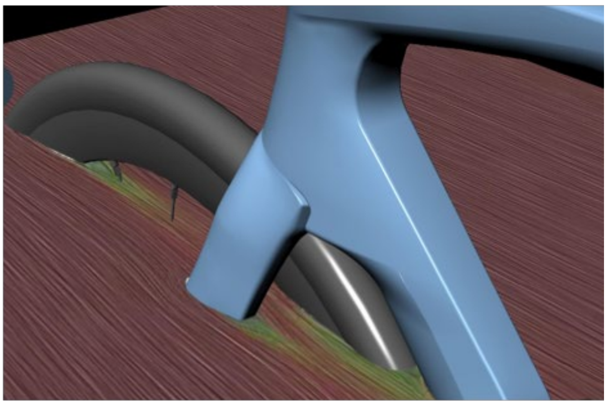
c. REDESIGNED FORK

Like the handlebar, the fork is one of the most important part of the bike in terms of aerodynamics. In fact, it is not only interacting with the airflow, but it is also driving the airflow along the rest of the frame and the rider's legs as well.
However, the primary function of the fork is to ensure the rideability and stability of the bicycle. Following this need, all Pinarello forks are designed with the ONDA (Italian for wave) shape that helps to absorb vibrations coming from the ground.
The new F12 fork has been developed keeping close consideration for these two principles, therefore the ONDA shape has been maintained but the lateral surface has been enlarged in order to improve the air flow and reduce drag.





In the image the difference in the longitudinal section of the F12 fork (light blue) with respect to the F10(green) is visible. This increased section allowed better air channeling and reduced turbulence behind the fork.
The result coming from CFD analysis compared to the F10 Disk and F12 Disk fork, shows a reduction of drag by 15.7% in favor of the F12 Disk. This is a significant result without compromising of the dynamic behavior of the fork.

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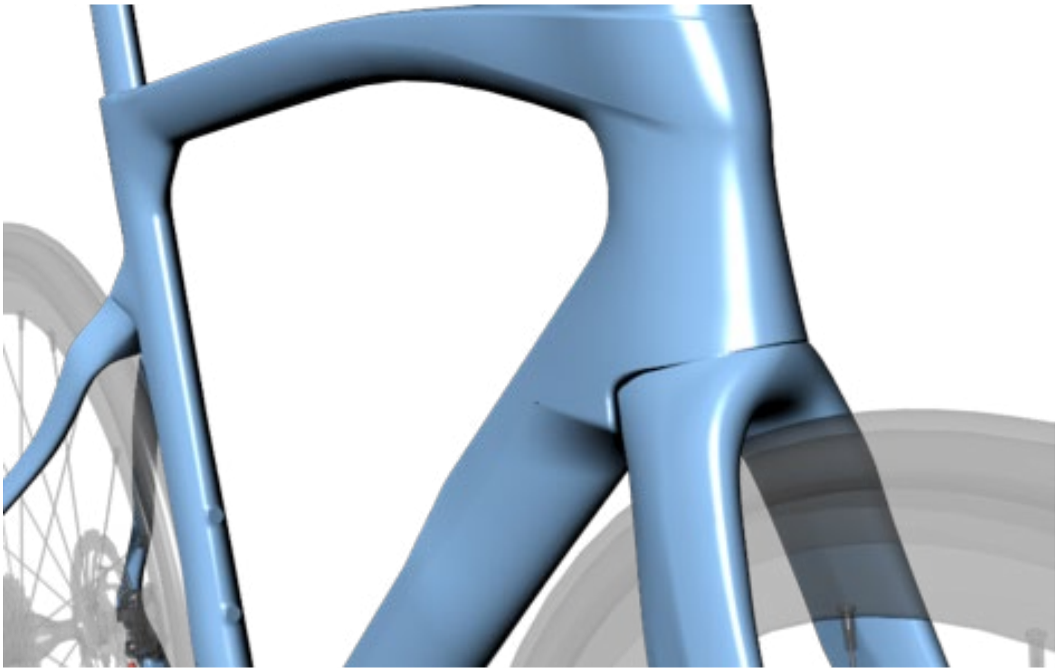
d. FRAME ENHANCEMENTS

The aesthetics of a Pinarello frame are always a heavily considered aspect of development, however every aesthetic improvement must be validated by a clear aerodynamic advantage. Developing the Dogma F12 frame we started from a design concept that could pursue the Pinarello's tradition as style icon but then every aesthetic element was analyzed and modified until it guaranteed a significant aerodynamic or structural improvement.
The result is a frame that from the aesthetic point of view shows a remarkable leap forward from previous generations but at the same time, it achieves the best aerodynamic efficiency values of any Dogma model to date.

The areas where concentrated efforts were made to guarantee aerodynamic improvements were:

• **Down tube:** the junction area nearby the headtube is designed to integrate the fork head. This way there is better airflow control around the tube. The Flat Back profile was also slightly modified reducing the lateral width in the back area. The Concave down tube was maintained as it has given proof of its efficiency.



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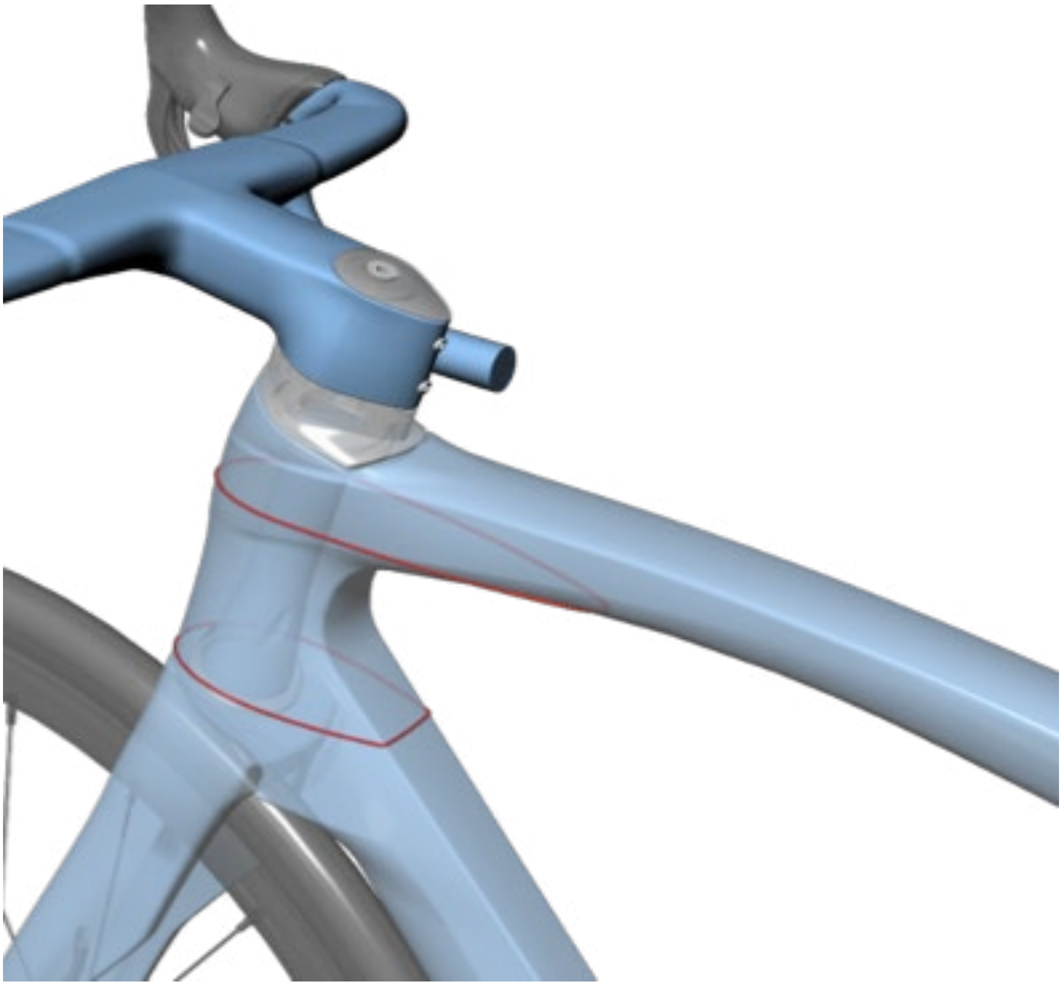
• **Head tube:** due to the cable routing integration the upper area was enlarged to assemble a 1" ½ bearing. This extra space allowed us to redesign the cross section with a more efficient aerodynamic shape.



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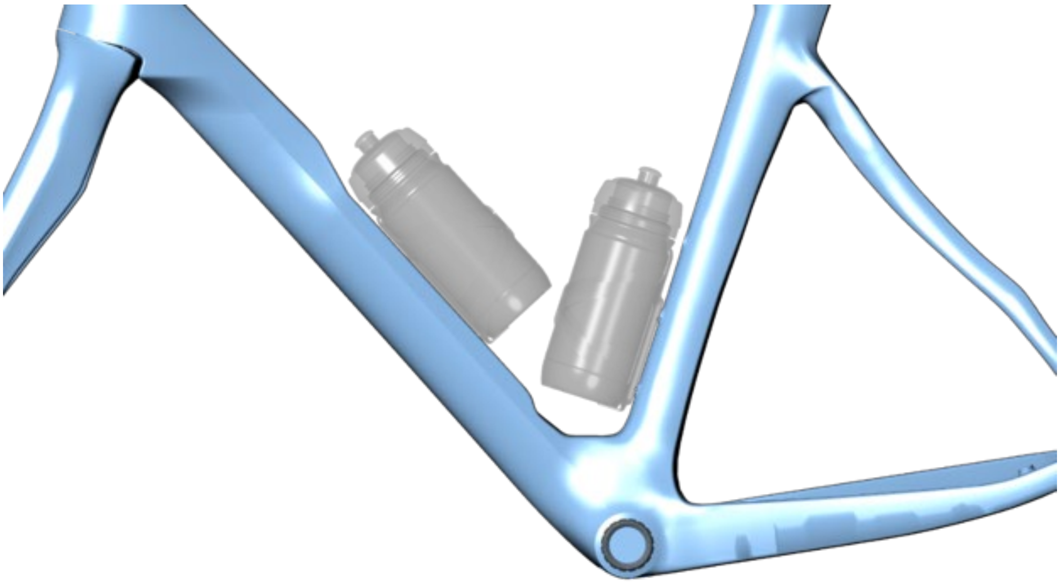
• **Bottom Bracket:** from an aerodynamic point of view, one of the most penalizing components is the water bottle. The concavity of the DT already hides the DT bottle from the air and partially the ST bottle as well. Understanding that if the ST bottle could be positioned lower its surface exposed to air is also reduced, thus improving aerodynamic efficiency. For this reason the BB area has been designed with an updated special shape that allows the ST bottle position to be lowered by 5mm.



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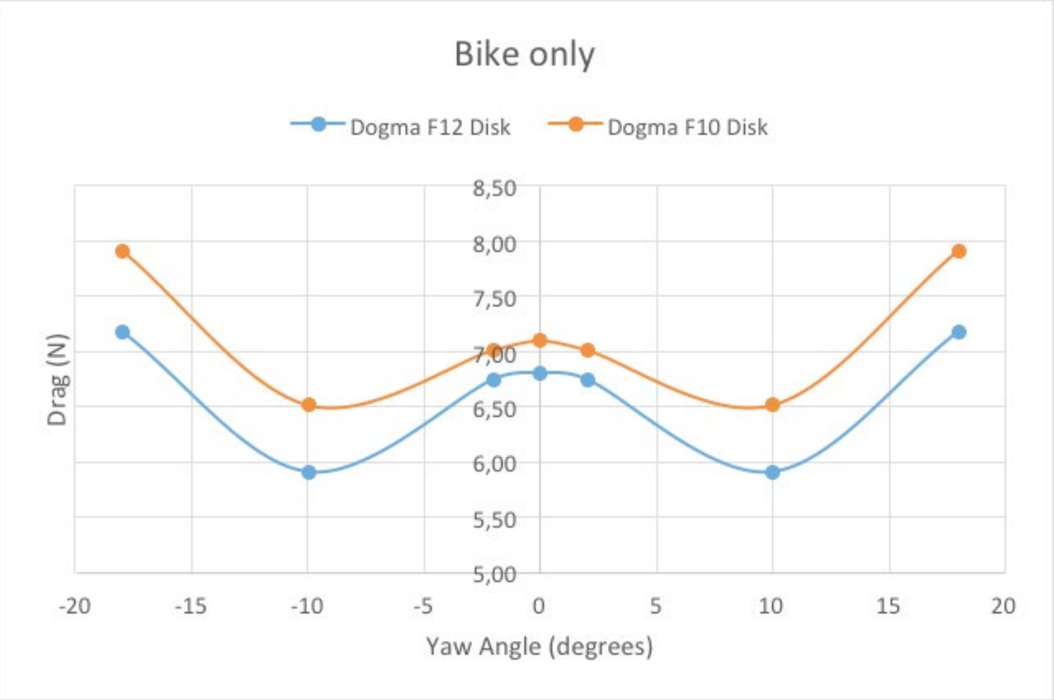
e. RESULTS

Through the efficiencies covered in the previous paragraphs, there is evidence of deep attention to detail on all aerodynamic aspects when developing the new Dogma F12. This constant research for drag reduction led to the following results.



The graph shows the drag value at different yaw angles between the Dogma F12 Disk and F10 Disk. This study was just the bike itself. On average there is an improvement in aerodynamic efficiency by 7.3%. The improvement is even more effective when increasing the yaw angle (lateral wind).

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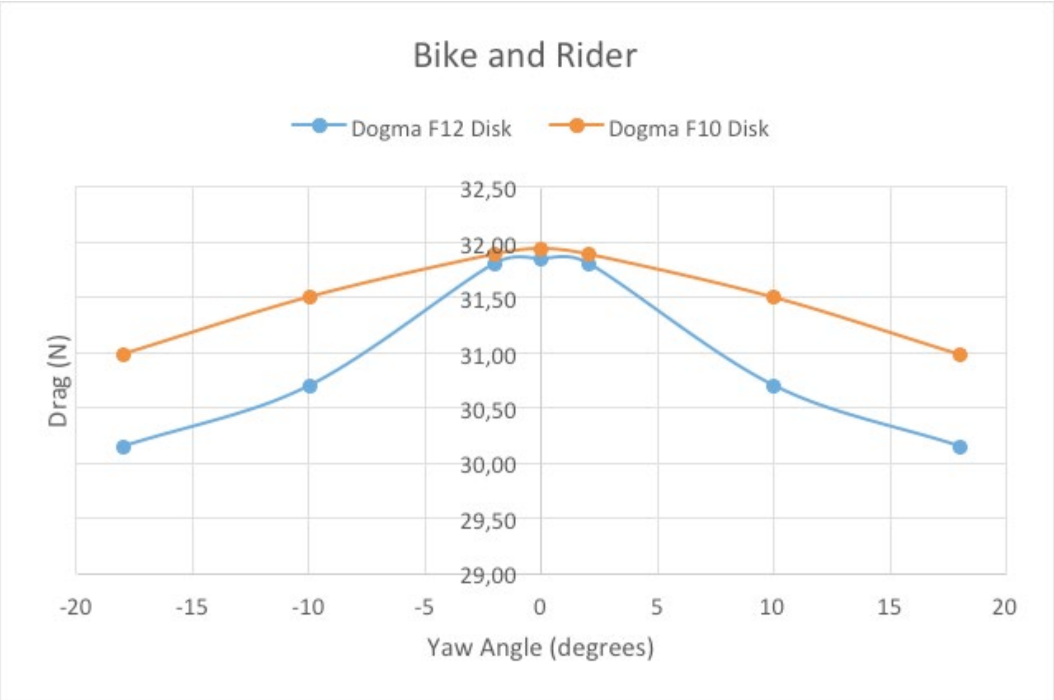
The next chart differs from the previous one as it includes the presence of the rider. These results are consistent with what was seen for the bike alone, even though the rider presence has a greater impact on the final result. However, there is an overall drag reduction of 2.8% (for example at 18° yaw). This means 85gr less aerodynamic force on the system for the bike + rider.
Looking at power savings rolling at 40km/h, the Dogma F12 was able to save 8 Watts compared to the Dogma F10!

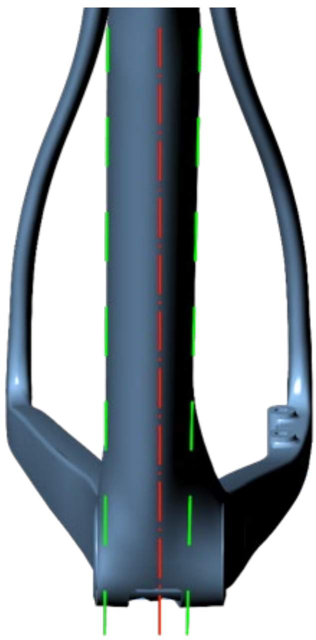


4. STRUCTURAL DESIGN

Cross sections and shape of tubes are as important as the material choice to ensure stiffness and lightness. At the same time, as discussed above, it has a meaningful influence on aerodynamics. Therefore, the final structural design is the optimal compromise between an aero and a stiff shape.

Since 2009, Pinarello has studied and developed the asymmetric frame that optimally counteracts the asymmetric forces developed during pedaling. In fact, on the right side of the frame pedal force and chain tension are acting as sum of the two, on the frame left side those forces are opposed. This means that the frame tubes must be enlarged on the right side to provide a symmetric behavior on the bike.

In 2013 Pinarello introduces the FEM (Finite Element Method) analysis to support the developing of the Dogma F8. FEM was able to highlight the need to design an asymmetric frame, demonstrating the need to not only enlarge but also move the tube cross section on the right side. Now while developing the Dogma F12 we have continued to pursue the path of the asymmetry to further improve the overall stiffness and performances of the bike.



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a. CHAINSTAYS AND BOTTOM BRACKET

The most crucial frame portion to guarantee the greatest power transfer from the rider to the wheel is the area of the bottom bracket and the chainstay. In fact, as mentioned previously on the asymmetry concept, the bottom bracket is where all forces are localized from the pedals and chain tension. The torque generated by the rider’s leg is transfer to the cassette and consequently to the rear wheel through the chain.

However, if the chainstays were to flex due to the forces involved, the distance between crank and cassette would be reduced and consequently there would be a drop in chain tension This results in a loss of power transferred to the rear wheel. It is therefore fundamental, for a correct performance-oriented design, to develop the chainstay tubing section in a way that they will not deflect under the torque generated by the rider.

On the F12 we maintained focus on the chainstay cross section. Our goal was to increase the moment of inertia and therefore the stiffness without adding weight. Without changing the other variables, such as material and thickness, the moment of inertia value is directly linked with the stiffness.

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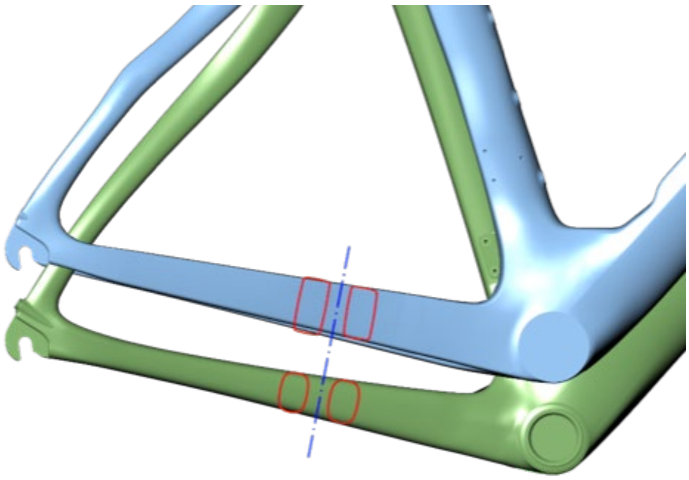
The picture below compares the Dogma F10 (green) vs Dogma F12 (light blue) chainstay cross section. On the F12 the section is more squared than the F10 where the section is rounded. This difference in the shape design leads to an increase of 45% of the lateral moment of inertia (Ix) on the Dogma F12 compared to the Dogma F10.



Ix: area moment of Inertia	Dogma F12	Dogma F10	F12 vs F10
Right Chainstay	8,4 e^(-9) m^4	5,8 e^(-9) m^4	+45%

While measuring the strength of the overall frame on our test machine we were able to prove an upgrade in lateral stiffness by 10%. This means that under the lateral pedaling forces the Dogma F12 can transfer more power to the rear wheel compared to the F10. This performance increase will be immediately perceived by the rider as a better responsive and stable frame as they get up on the pedals.

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b. DOGMA F12 DISK DEDICATED FEATURES

Development of the new Dogma F12 was always led by the desire to define specific and dedicated technical solutions for the disc brake and for the rim brake version. In fact, even though the two frames may have many common aspects, the presence of different braking systems and how these subsequently interact with the frame / fork requires a dedicated study for each.

On a bicycle equipped with disk brakes, one of the common feelings that the rider has during heavy braking is the twisting of the fork on the left side and consequently a deviation from their desired trajectory. This behavior is caused by the asymmetric position of the brake caliper and rotor in respect to the wheel's rotational axis.

We have simulated this through FEM analysis and find out that heavy braking forces result in a twisting of the forks due to asymmetrical loading by the disk brake system. The net result of this twisting is approximately 1.5 degrees turn of the front wheel from the handlebar orientation. Therefore, our focus was on tube geometry of the left fork arm and how this may be altered to reduce this turning.

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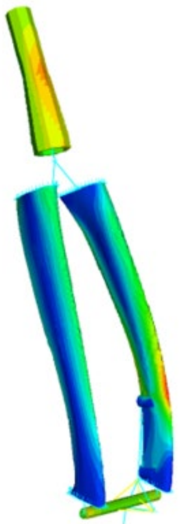
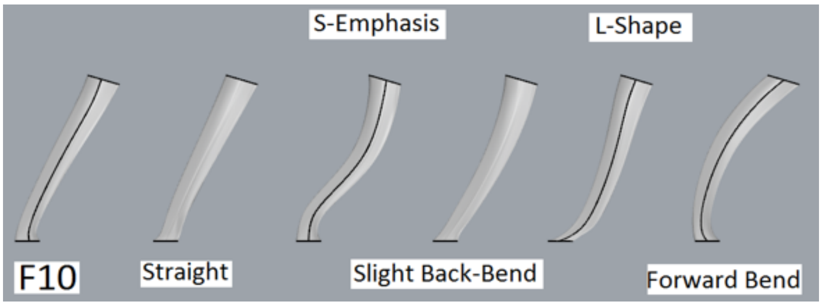
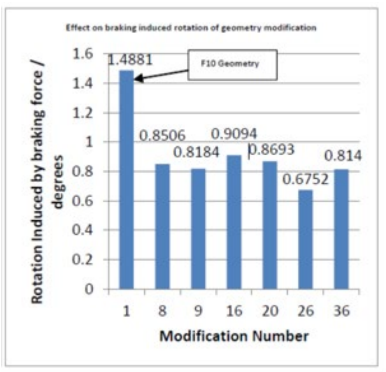
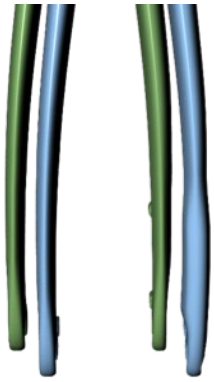
The analysis shows that the twisting effect can be reduced by working on the left arm cross section and on the curved shape of the fork. In fact, we have tested several fork geometries and discovered that a forward bend shape has a significantly positive result in reducing twist of the fork.
The defined Dogma F12 Disk fork design is the result of more than 36 different iterations of geometries explored with FEM. This is done in order to find the best fork shape that reduces twisting without adding weight or having aerodynamic penalties. Visible in the pictures below, the F12 Disk fork presents an enlarged cross section around the brake caliper connection and when looking from the lateral side the ONDA shape it is slightly moved forward compared to the F10 disk fork.

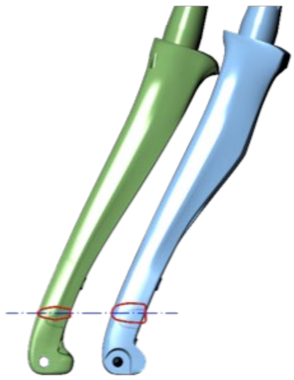




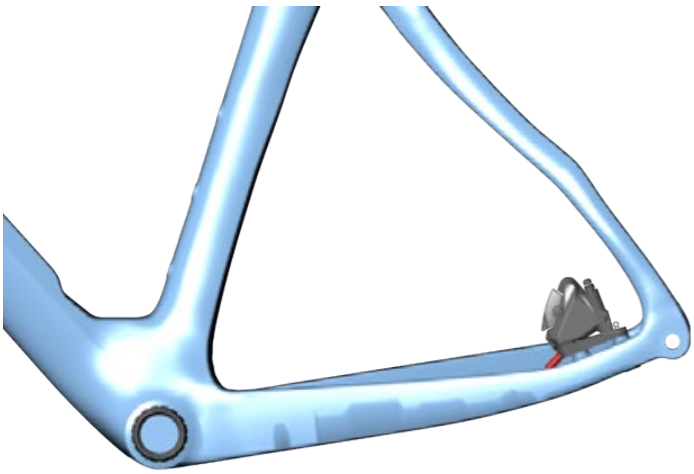
This new fork design allowed reduced twisting effect by more than 40% compared to the previous one.







The right chainstay has been designed following the same principles. The shape is not straight, nor parallel to the right one, in fact it is dropped down and then shaped upwards nearby the rear caliper connection. This shape, also studied with FEM, guarantees a reduced deformation of the chainstay under the stresses coming from braking power.



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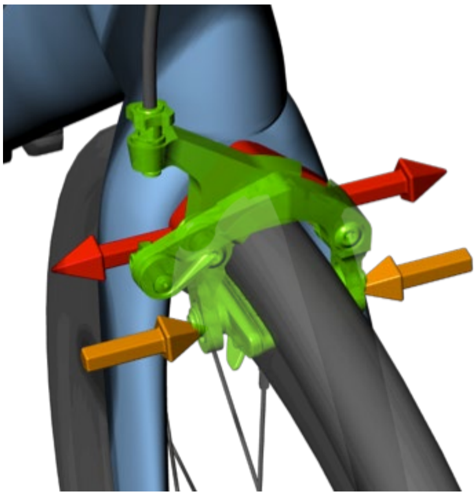
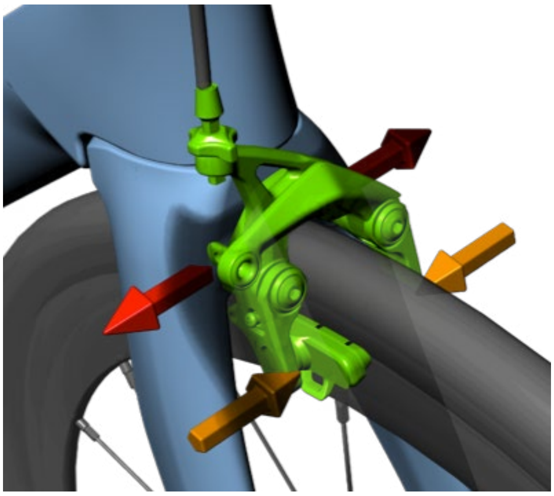
c. DOGMA F12 RIM DEDICATED FEATURES

Even with riders recognizing the benefit coming from the disc brakes on road bike, there still a large amount of riders who prefer the tradition rim brake systems due to its lightness and ease of use. It is a fact that among professional athletes this solution is still preferred, even more if they are to face demanding mountain stages. However, the need to have a more effective and powerful braking system is also required by them.
To satisfy this need, brake manufacturers have improved versions of the classic rim brake system, with the use of direct mount brakes. The main difference is how the brake caliper is connected to the bike frame. On the traditional systems the caliper is connected by a single pivot to the frame, so the entire brake arm has to support the forces generated by the pads. In a heavy braking situation this can cause a deformation of the brake (the red arm in the picture below) and a decreasing of the braking power.





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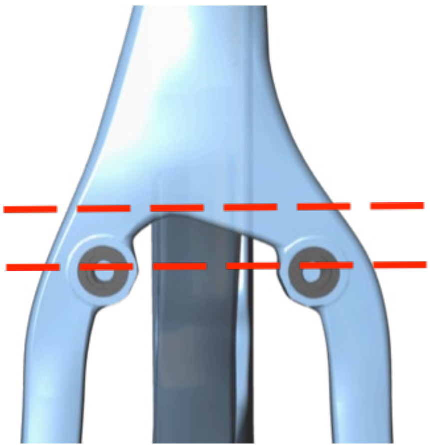
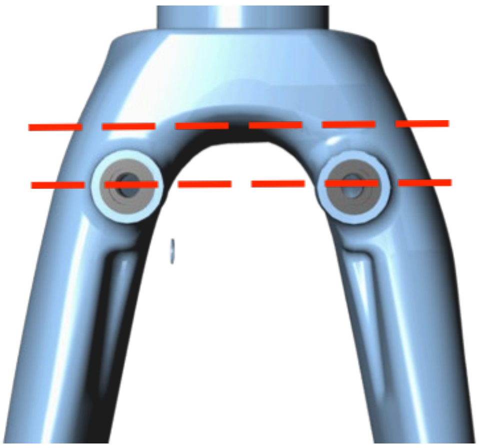
On the direct mount version, the brake caliper pivots are connected directly to the fork / frame. As visible from the picture above, the forces coming from the brake pads are directly loaded on the fork/frame. This makes it stiffer and does not deform as the brake arms do. In the end the brake system is more rigid and allows transfer of higher braking power to the pads. Brake manufacturers declare an increase in braking power by 12.5% (dry conditions) to 25% (wet conditions) for the direct mount version compared to the classic pivot system.

From a frame structural design point of view, it is clear that the increase of rigidity of the braking system means more stress transferred directly to the fork head and to the seat stays. It was fundamental to reinforce the area around the brake inserts. The forces coming from the brake pads are transferred to the frame through these inserts and they tend to move the inserts away from each other. If this happened, there will be a loss of braking power because most of the energy deforms the fork arms or the seatstays.

For that reason, for the Dogma F12 we have designed the fork head to lower the profile as close as possible at the brake inserts position to create a reinforcing element that contrasts the forces coming from the pads. Also, on the rear side, the monostay is designed with a lower profile close to the braking inserts. As you can see from the pictures below the gap between fork head/monostay and the horizontal inserts line is reduced as much as possible, while maintaining compatibility for desired tire clearance. This technical design increases the frame stiffness and prevents deformations, allowing the direct mount braking system to work at its best.





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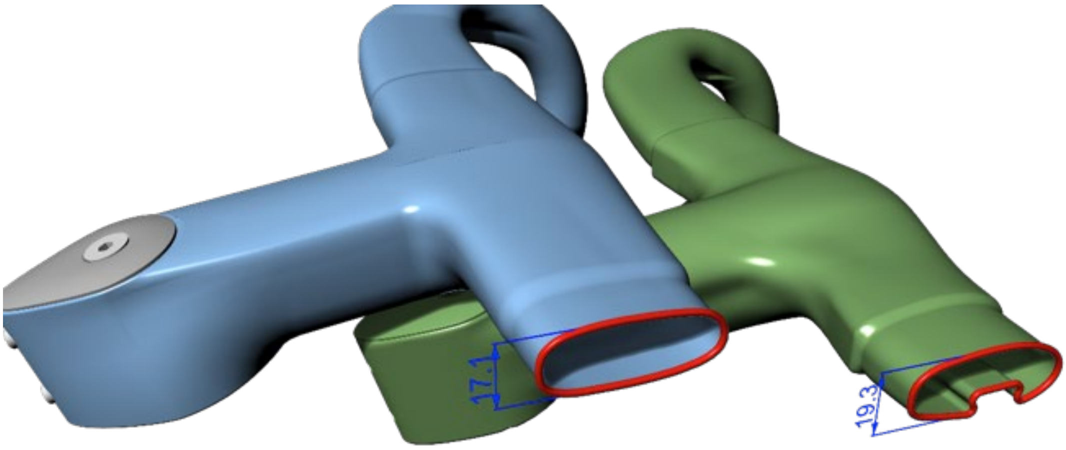
d. TALON ULTRA STRUCTURAL DESIGN

The new handlebar developed specifically for the Dogma F12 and F12 Disk: the Most Talon Ultra, not only has aerodynamic advantages coming from the cable routing integration, but it also has structural improvements compared to the previous Talon Aero.
In fact, the need to hide the cables from airflow in addition to routing them completely internally from the bar allowed us to re-design the bar cross section. The Talon Aero cross section was called the “C section” because there was the need to keep the cables external but somehow hidden under the bar profile.
On the new Talon Ultra the cables completely route internally so the cross section can be rounded. The cross section flexural moment of inertia becomes very similar to the Talon Aero but saving 12% of the sectional height, improving aerodynamics and reducing the frontal surface area.



In addition, with the integrated cable routing, the internal surfaces of the handlebar must be of the same quality level as it is externally. This means that there cannot be excess material or glue residue on the internal side of the bar. This leads to having a lighter and higher quality carbon product. The stiffness test done by loading 500N at the brake lever position showed an increase of stiffness in Talon Ultra vs Talon Aero. For the handlebar size 44/140, the stiffness increase reached a value of 8.77% even with a reduction in weight by 40gr, over 10%.

Model	Size	Weight (gr)	Left Displ. (mm)	Right Displ. (mm)	L&R Avg.
TALON AERO 2017	44 x 140	403,9	9,41	9,48	9,445
TALON ULTRA 2019	44 x 140	362,4	8,71	8,56	8,635

-10,27%
Weight

-8,58%
Stiffness

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e. MATERIAL CHOICE

The proper choice of material will deeply influence the performance of the frame. Carbon Fiber Reinforced Polymer (CFRP), in particular, can be optimized for every single area of the frame to achieve the best stiffness and lightness, based on the localization of stress.
On the Dogma F12 and F12 Disk, the main material used is Torayca T1100 1K carbon, which ensures the highest tensile strength in the world. This choice contributes to increased impact strength to prevent breakages. Thanks to the highest grade of carbon fiber used (especially higher strength) we were able to get a lighter frame while maintaining strength. The T1100 fibers have been used in the higher stressed areas, in order to take advantage of its incomparable strength.

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5. VERSATILITY

One of the key words for the Dogma F12 project was: “Versatility”. The PinaLab was constantly thinking how to make this bike with ease of use and compatibility with all the most recent standards at the same time. The innovations and solutions that have been found are summarized below.

a. GROUP SET INTEGRATION

In 2017, on the Dogma F10, Pinarello introduced E-Link for the first time. A dedicated slot on DT to place a Shimano Di2 junction. This integrates the junction in an easy and accessible way for adjustment and battery recharge. Since the one of the targets of the Dogma F12 is to increase the level of integration, the E-Link has now evolved to become the control center for all types of groupsets. The slot on DT and the various interfaces are designed to be compatible with all electronic groupsets and even mechanical groupsets can be adjusted through it.

Due to the highest level of cable routing integration, there is no longer the ability for mechanical groupsets to have the FD adjuster on the cable housing under the handlebar. For that reason, a dedicated adjuster has been developed to be placed into the E-Link slot, allowing adjustment of the FD cable simply through an Allen key screw. This system, based on the relative movement of two inclined prisms, enables a housing displacement of 4mm. This is a more precise way to adjust compared to all other external FD adjusters available on the market.

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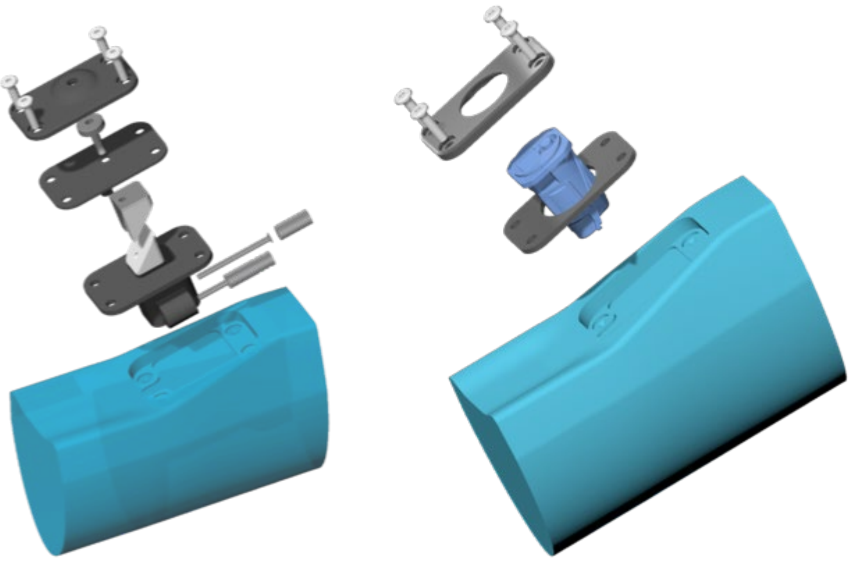
The Dogma F12 E-Link is compatible with:

- Shimano Di2 : an adapter for junction EW-RS910 is included in the F12 kit
- Sram eTap AXS and eTap: a closed cap is included in the F12 kit
- Campagnolo EPS: an adapter for the junction is included in the Campagnolo groupset kit
- Mechanical: a FD adjuster is included in the F12 kit



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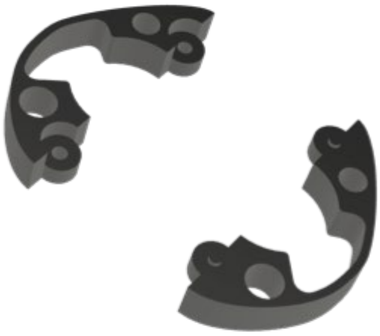
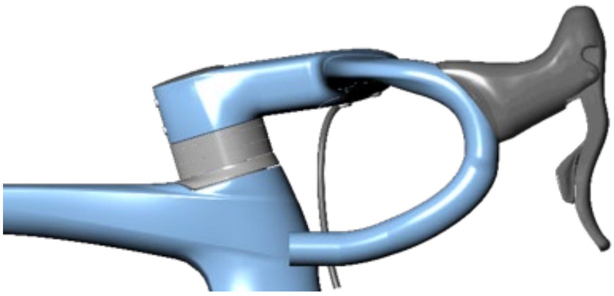
b. HEADSET SPACER VERSATILITY

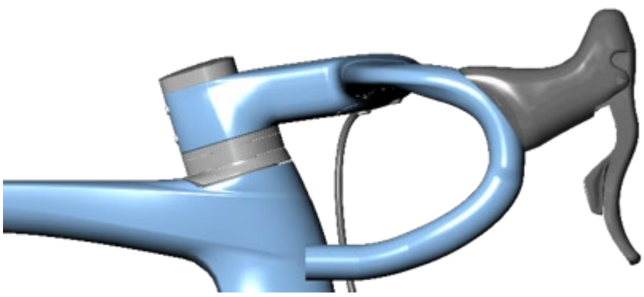
The need to adjust handlebar stack is common for all riders regardless of their ability. Sometimes even during the season there is the need to raise or lower the stem. This functionality, being trivial in traditional bicycles, has becomes more difficult when cables are integrated into the handlebar and headset. Most of the time it is necessary to remove all cables from handlebar and remove the handlebar itself in order to take out or place additional spacers.
The PinaLab has created special split spacers that can be easily placed or removed between the top cap and the handlebar stem. This is far more efficient than traditional spacers that have to rise up the stem along the steering tube. Now without disassembly of the cables from the handlebar, the split spacers can be placed (or removed) into the desired position.

The spacers are available in 5mm and 10mm height. The maximum stack ranges are:
• 50mm (5 x 10mm spacers): when using the lower top cap (9mm)
• 40mm (4 x 10mm spacer): when using the medium top cap (19mm)
• 30mm (3 x 10mm spacer): when using the higher top cap (29mm)



The split spacers have larger dimensions because of having to fit with the 1" ½ upper bearing. So, they cannot be used on the upper side of the handlebar. For the upper side, the standard existing aero spacers can be used.





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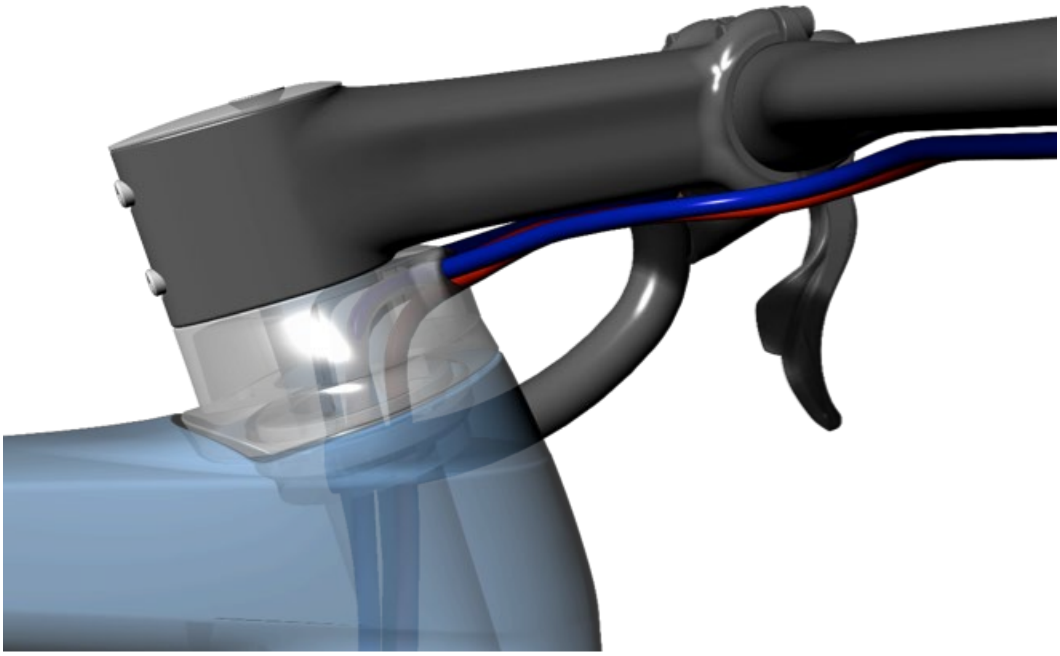
c. STEM ADAPTER

Even though the Dogma F12 was designed to work at its best in combination with the integrated Most Talon Ultra, we recognize that some riders still prefer other stem-bar solutions. To satisfy these needs the PinaLab has developed a stem adapter to be placed on the steering column where cables can be run into.



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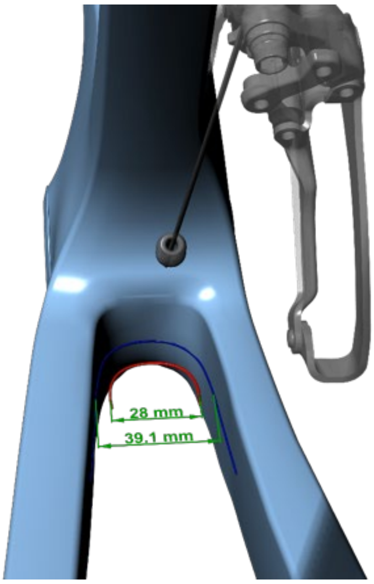
d. TIRE CLEARANCE

A current trend in the road bike world is a move towards wider tires. Even with the standard for pro riders still being 25mm tires, it is not unusual for others to equip a road racing bike with 28mm tires, especially if more comfort is required for longer distances. For that reason, the Dogma F12 and F12 Disk are designed to accommodate 28mm tire clearance.
In reality the tire clearance is 37.5mm, however we have included consideration for the ISO 4210 norm, which specifies 4mm space between the tire and frame. Analyzing several tire and rim combinations we have given a declared value of 28m. In reality a declared 28mm tire can have a real width of 29.5mm. That's the reason why the frame has been designed with 37.5mm clearance. This allowed the F12 frame to be compatible with all the most aerodynamic wheels that has a 30mm width.



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6. TECHNICAL SPECIFICATIONS

a. SPECIFICATIONS

DOGMA F12 DISK

- Carbon Torayca T1100 1K Dream Carbon with Nanoalloy Technology
- Asymmetric Frame
- Fork ONDA F12 with ForkFlap™
- TICR™ Total Internal Cable Routing
- E-Link™
- Drop in Bearing System 1" 1/2 - 1"1/2
- Italian thread BB
- Seatclamp TwinForce
- 3XAir™ two positions available for the second bottle
- FlatBack Profile
- UCI Approved
- RAD SYSTEM Disk brake
- Front Axle 100x12mm Shimano®
- Rear Axle 142x12mm Shimano®
- Disk Flat Mount max 160mm
- Max Tire 700x28mm
- Weight: 840g; raw frame, not painted

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DOGMA F12

- Carbon Torayca T1100 1K Dream Carbon with Nanoalloy Technology
- Asymmetric Frame
- Fork ONDA F12 with ForkFlap™
- TICR™ Total Internal Cable Routing
- E-Link™
- Drop in Bearing System 1” 1/2 - 1”1/2
- Italian thread BB
- Seatclamp TwinForce
- 3XAir™ two positions available for the second bottle
- FlatBack Profile
- Direct Mount Brake system
- UCI Approved
- Max Tire 700x28mm
- Weight: 820g; raw frame, not painted

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b. FRAME SIZES

Pinarello is has always offered every single rider the best bike. We developed 13 sizes to allow every rider to find the best fit for their body. Everyone of these sizes are designed and produced individually: the bigger sizes are reinforced and shaped in order to bear higher stresses, the smaller sizes can be made with less material, saving weight.
The Dogma F12 Disk and Dogma F12 shares the same sizes and geometries. These geometries came directly from the Dogma F10, again synonymous for handling and responsiveness. The only difference is on sizes 530 and up, where the head tube is shortened by 5mm to meet the needs of the more sportive riders.
Since on the Dogma F12 Disk and Dogma F12 the headset top cap is integrated with the frame, reach and stack measurement are calculated on top of the 9mm top cap.

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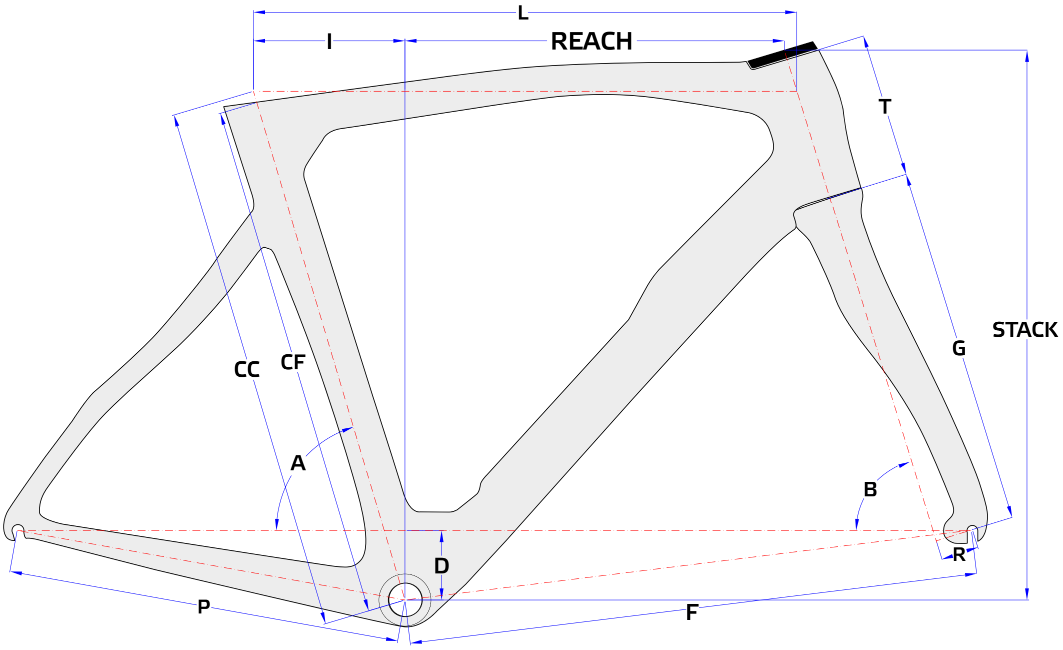
6. TECHNICAL SPECIFICATIONS



CF	CC	L	I	A [º]	B [º]	F	P	T	D	R	G	REACH	STACK
415	**420**	498	113	74,40	69,15	564	406	94	67	43	373	348,9	498,3
435	**440**	503	118	74,40	70,00	564	406	99	67	43	373	354,3	506
455	**465**	515	125	74,40	70,50	573	406	104	72	43	373	364,8	517,6
455	**470**	525	128	74,00	71,40	575	406	114	72	43	373	370,5	530,2
480	**500**	525	138	74,00	71,40	575	406	109	72	43	373	372,1	525,4
495	**515**	535	145	73,70	72,00	577	406	114	72	43	373	378	532,3
510	**530**	545	149	73,70	72,50	583	406	123	72	43	373	383,3	542,6
520	**540**	550	154	73,40	72,80	583	406	131	72	43	373	385	551,2
530	**550**	557	157	73,40	72,80	590	408	142	72	43	373	388,8	561,6
540	**560**	565	164	73,00	73,20	591	408	149,5	72	43	373	390,7	570,2
555	**575**	575	168	73,00	73,70	596	408	163	72	43	373	396,7	584,8
575	**595**	587	180	72,40	73,40	605	408	199	67	43	373	393,3	613,3
615	**620**	620	192	72,00	73,40	633	411	239	67	43	373	410,1	651,7

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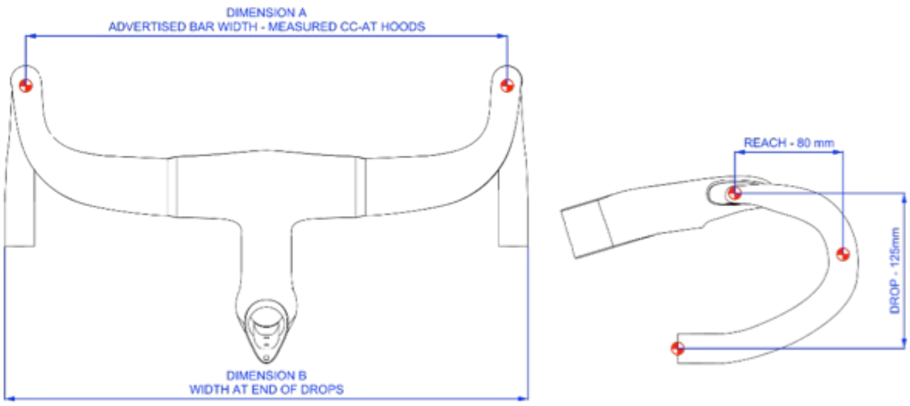
c. MOST TALON ULTRA SIZES

	STEM LENGHT (mm)					
HANDLEBAR WIDTH (cm)	42/90	42/100	42/110	42/120	42/130	
	44/90	44/100	44/110	44/120	44/130	44/140
		46/100	46/110	46/120	46/130	46/140

The new Most Talon Ultra handlebar is developed in 16 different sizes.



DIMENSION A			DIMENSION B					
42	**44**	**46**	**42**	**44**	**46**	**DROP**	**REACH**	**OUT. BEND**
385	405	425	420	440	460	125	8	4°

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7. RACING

a. UCI APPROVED

The Dogma F12 Disk and Dogma F12 are both UCI approved. They are ready to be used in all international competitions.

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b. DEBUT

The Dogma F12 will debut in May 2019 with Team Ineos. It will be the first bike developed with and for them, in the pursuit of new victories.

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