

# Filante SLR <sup>ID2</sup>

## WHITEPAPER



### DESIGN BRIEF

Speed, in Wilier, isn't merely a measurement: it's an ideal, a philosophy deeply rooted in time. For Wilier Triestina, speed is not just a technical detail or a number in a wind tunnel: it is Culture.

An approach that unites engineering research, the experience of athletes, and a sensibility for design. A profound passion for cycling and for work, which stems from craftsmanship mastery and the steadfast desire to offer future generations an experience that is absolutely pure.

The Filante SLR <sup>ID2</sup> embodies this vision. It is not a mere update but the most advanced expression of a tradition that starts with Wilier's first aerodynamic models, passes through experiences like the Supersonica SLR, and now redefines the boundaries of efficiency on the road. Every detail is born with a clear objective: to put the athlete at the centre, enhancing their position, their feeling, and their real experience on the road, to allow them to become faster in the real world.

## AERODYNAMIC DEVELOPMENT: BICYCLE AND CYCLIST, ONE SINGLE ENTITY

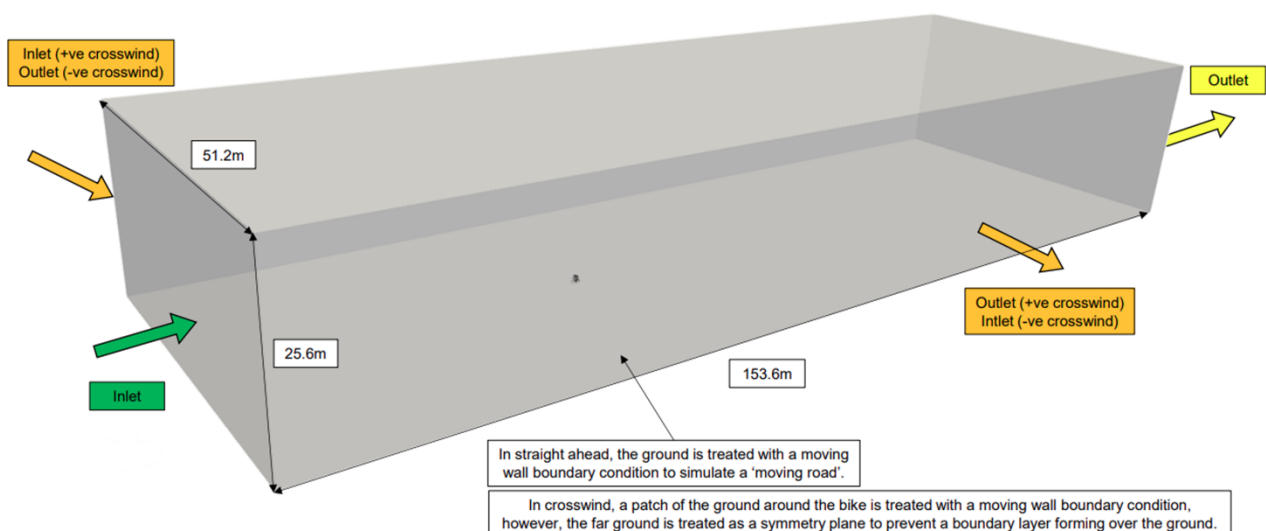
Pure aerodynamic efficiency is not enough if the real-world result does not meet our standards for ride quality. When we decided to rethink the Filante SLR, we asked ourselves a simple but decisive question: *how can we raise the performance bar even higher?* Together with the technical staff of the Groupama FDJ - Cycling Team, we analysed every detail to understand how far we could push ourselves.

After the milestones achieved with the Supersonica SLR, it was clear that expectations were extremely high, especially on the aerodynamic front. The goal? To create a bike capable of guaranteeing maximum efficiency even outside time trials. An ambitious challenge, which contained a paradox: bringing together extreme aerodynamics with light weight, responsiveness, and ride quality at the same time.

Just as with the Supersonica, we didn't stop at the frame. We studied the entire race ecosystem: the complete bike, components, and replacements, and we placed the most important element at the centre: the athlete themselves. This is because the aerodynamics of the bike alone are not enough: what truly matters is real speed - the kind that translates into unique feelings and superior performance on the road for the cyclist.

However, to develop the new Filante, we didn't rely only on race experience: we used the most advanced CFD simulations.

Like all the aerodynamic frames developed by our Innovation Lab, the Filante SLR <sup>ID2</sup> was designed following a precise design process with clear, well-structured stages. The design brief was translated digitally into a 3D model consisting of a frame, fork and handlebar. This set of components was then split virtually into thousands of small cells which, in computational jargon, make up a mesh.



[CFD Testing Volume]

All this helped to complete a first analysis of the design idea using CFD software. By solving the Navier-Stokes equations, this software simulates virtually and describes the behaviour of a fluid (air in our case) around an object. Once the object has been defined, the first step is to define the physical and environmental conditions under which it will be analysed.

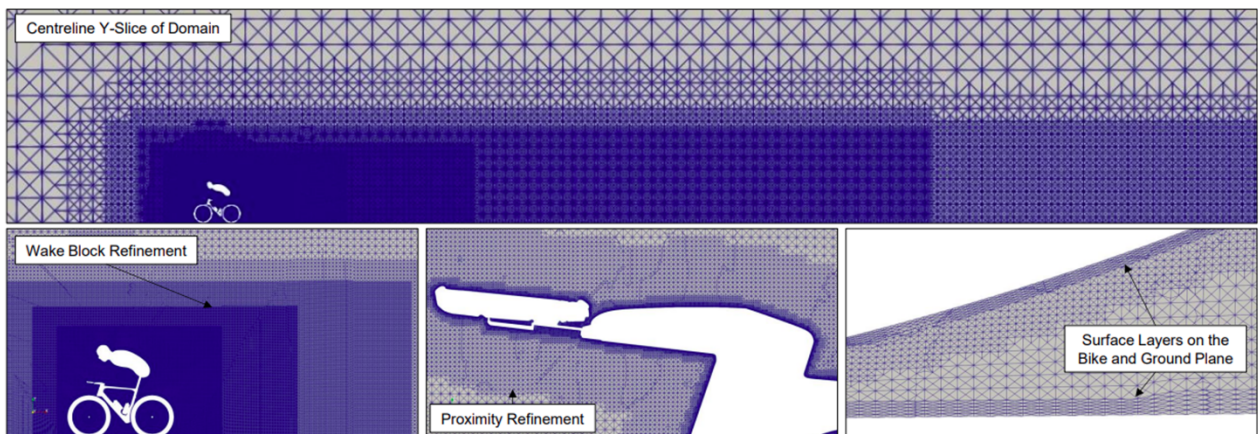
In our case, air velocity is the most important parameter. At this point, the software calculates how air moves on the surface of each mesh cell. The result obtained defines how aerodynamic a 3D model is. If the results are not as expected, the 3D design is remodelled, where possible improving shapes and trying to optimise flows so as to reduce drag. All of this in theory, at least.

In practice, things are far more complicated. One of the first hurdles is computational power: during a CFD simulation, the computer must solve billions of small mathematical equations – one for each mesh cell – in order best to simulate the motion of air. This requires extremely powerful computers with hundreds of processors working in parallel. CFD simulations, therefore, are very expensive, yet they do allow great freedom of experimentation. They make it possible to fine tune many small details, which in the end – added together – make a real difference, leading to a substantial improvement in product performance.

The first areas of intervention concerned the leading edge, in other words the set of surfaces that first interact with the airflow and critically influence its behaviour. The analysis sequentially focused on the fork, head tube, handlebar, down tube, and seatpost, optimising geometries and profiles to reduce turbulence.

A correctly designed leading edge allows for a reduction in aerodynamic drag and keeps the laminar flow attached to the profile for longer, resulting in a clear improvement in overall efficiency.

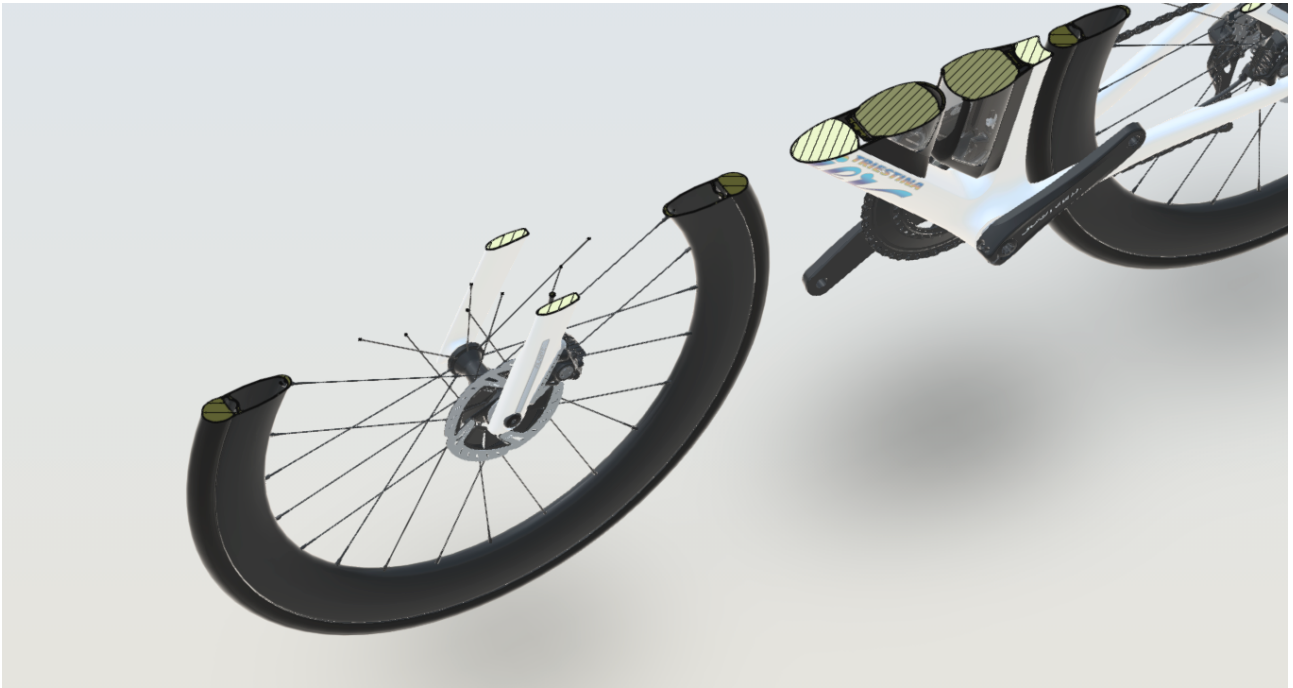
**Wake Block Refinement:** Refinement of cells based on geometric min/max dimensions.  
**Proximity Refinement:** Refinement of cells based upon distance from surfaces.  
**Surface Layers:** 5 layers of rectangular cells to better approximate boundary layer and are conformant to geometry. These are present on the bike and ground plane near the bike.



[CFD MESHING]

## MORE DATA, LESS DRAG: THE NEW AERODYNAMICS OF THE FORK

For the fork alone, we designed and analysed several NACA airfoils - aerodynamic shapes derived from aeronautics and mathematically defined to ensure maximum efficiency in the airflow. Every airfoil was tested in combination with the wheel and tyre through CFD simulations, considering different wind incidence angles to reproduce real-world usage conditions.



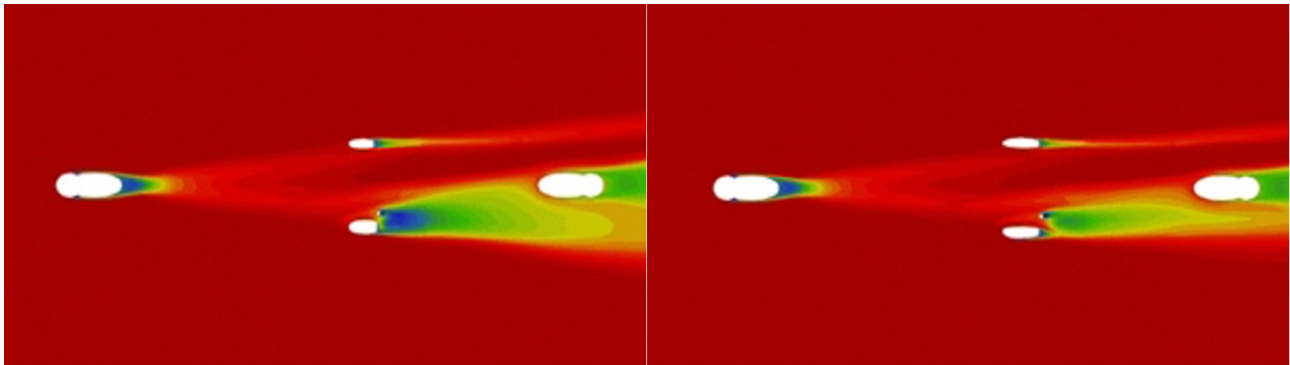
The process required three times the number of CFD simulations used in the development of the Supersonica SLR, resulting in an exponential increase in the volume of data to process. This systematic approach allowed us progressively to refine the geometries, eventually defining a completely new solution: a fork characterised by an external NACA airfoil and an internal flat inner profile, designed to minimise interactions with the wheel and tyre and maximise aerodynamic stability.

In designing the new fork, we paid particular attention to the crown cone. From the experience gained with the Verticale SLR, we learned that a steeper inclination allows for more homogeneous carbon lamination, capable of increasing stiffness and, at the same time, reducing overall weight.

With the Filante SLR <sup>ID2</sup>, we pushed this concept even further: the even more pronounced cone guarantees greater torsional stiffness and superior stress resistance, improving steering precision in all conditions.

The left fork leg integrates a slim aerodynamic fin that skims the disc and envelops the brake caliper: a partial fairing already successfully experimented with on the Supersonica SLR, now further refined.





Filante SLR

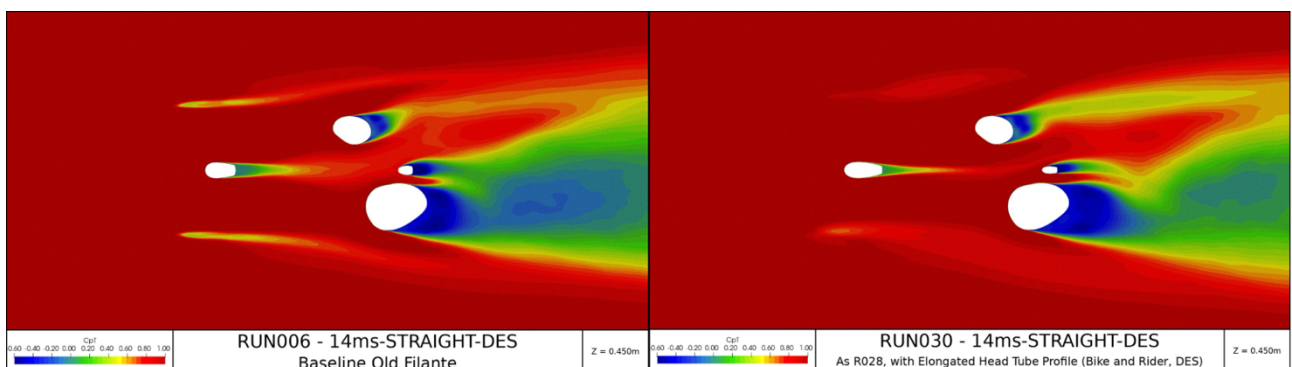
Filante SLR ID2

Finally, the thru axle clamping bushing has been completely encased into the right fork leg: a solution which combines aesthetic elegance, clean-cut silhouettes, and a tangible benefit in terms of aerodynamics and practicality.

## THE HEAD TUBE: SLIM, CLEAN, FAST

The head tube has been further improved to allow the air to flow more smoothly and efficiently. The leading edge remains faithful to the previous version, but the profile now develops into more tapered and slender shapes, capable of further reducing drag.

As always at Wilier, technology meets elegance: the brake and shifts cables are routed directly from the handlebar into the head tube, resulting in total integration that combines clean-cut aesthetics, aerodynamic performance, and unparalleled craftsmanship.



Filante SLR

Filante SLR ID2

## NEW F-BAR <sup>ID2</sup> HANDLEBAR

The Filante SLR <sup>ID2</sup> débuts with the new F-Bar <sup>ID2</sup>, an aerodynamic cockpit completely redesigned in collaboration with the technical experts and athletes of the Groupama - FDJ Cycling Team. After developing and testing nine types of moulded titanium handlebars, we defined the final *O.E.F. (Optimized Ergonomic Flare)* version. This is an orthogonal flare of 3 cm between the high and low grip which, unlike other handlebars with differentiated widths, does not compromise the ergonomic studies designed by the transmission control manufacturers.

This is an absolutely exclusive solution that guarantees the cyclist greater control in the low grip, a more tucked and aerodynamically efficient position, and a natural and comfortable grip. The control area features a slight upward rise that improves forearm support when resting in an extended position, increasing comfort and stability on long rides without sacrificing stiffness.

Integration with the frame has been optimised by lowering the head tube and introducing new top covers and concave spacers that increase the contact surface, improve responsiveness, and ensure aesthetic continuity, while the convex shape of the handlebar curve reduces the height difference between the handlebar and the top tube, improving aerodynamics.

For the first time on a Wilier product, the handlebar clamping hardware is completely hidden, benefiting aesthetics, protection from dirt and sweat, and aerodynamic performance.

The Filante SLR <sup>ID2</sup> is also compatible with V-Bar, Z-Bar, and F-Bar ID1 handlebars.

## DOWN TUBE AND AEROKIT, THE MOST COMPLEX CHALLENGE

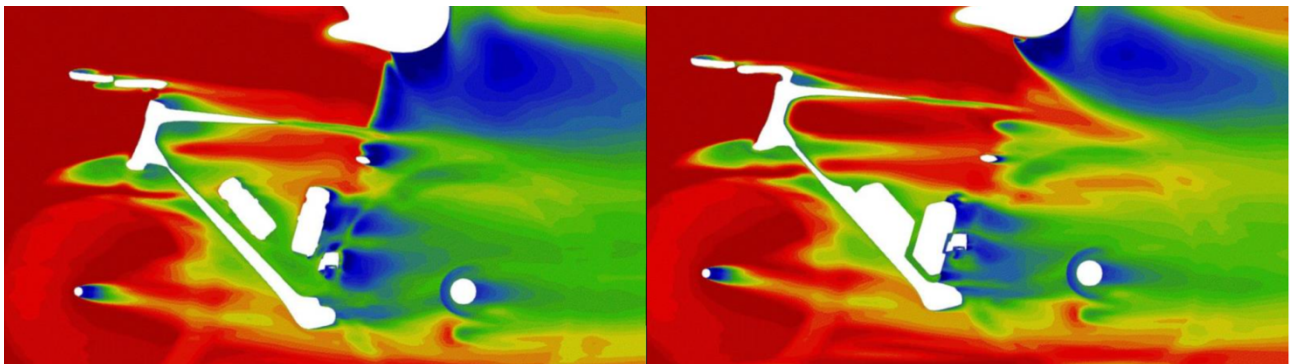
The down tube, which has always been one of the most complex areas from a design perspective, was developed with a precise goal: to have the minimum aerodynamic drag and to reduce the exposure of the water bottles to the air as much as possible.

To achieve this result, we chose a dual-section solution. The upper part, very thin and shaped according to a NACA airfoil, works near the head tube to ensure maximum aerodynamic penetration. The lower part, however, is wider and more enveloping, designed to incorporate and shield the water bottles, reducing the turbulence traditionally generated in this area.

From the first tests, even when using round water bottles and traditional bottle holders, the design proved to offer a clear improvement in performance. We decided to push further for greater integration and to reduce air drag further. This is where the Aerokit project took shape: a custom system of aero bottles and bottle holders, with a tapered profile and fully integrated into the frame, which functions as a kind of spoiler capable of making the airflow cleaner and more regular.

CFD simulations immediately confirmed our intuition with unequivocal results. With a round bottle paired only with the Aerokit base, aerodynamic drag is reduced to less than half compared to the Filante SLR <sup>ID1</sup>. With the complete Aerokit, the drag is reduced by over two-thirds.

In the CFD visualisations, the analysed section clearly shows how the new down tube, combined with the integrated system, generates an extremely more ordered flow within the main triangle: the area free of turbulence, represented in red, is much more extensive on the Filante SLR <sup>ID2</sup>, highlighting a concrete technological leap in terms of aerodynamic efficiency.

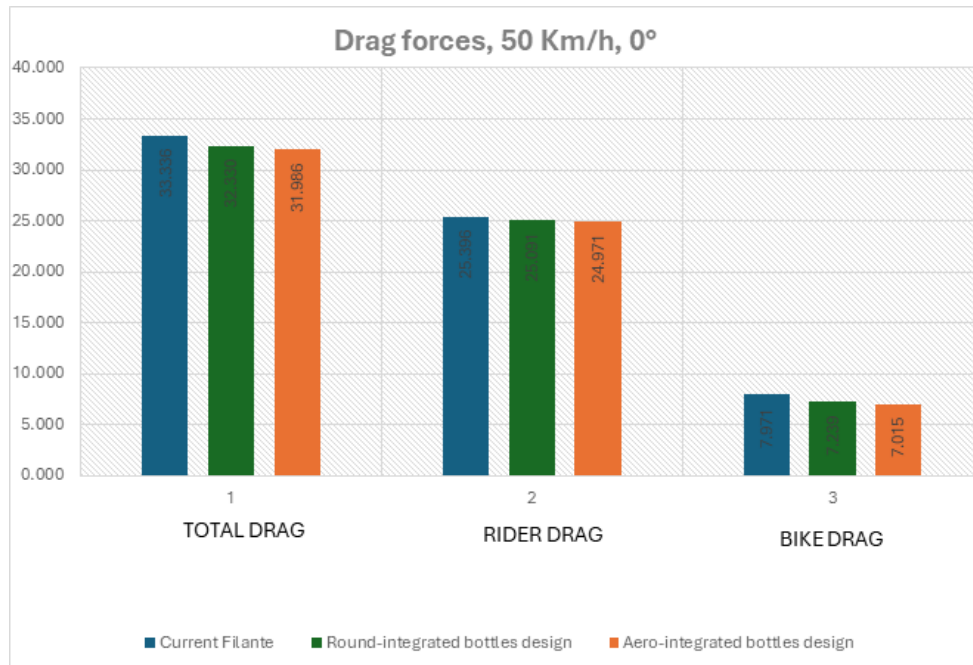


Filante SLR

Filante SLR ID2

The histogram below clearly shows the differences between the three setups analysed: the Filante SLR with traditional water bottles, the new Filante SLR <sup>ID2</sup> with integrated bottle holder and standard bottles, and finally the version equipped with the complete Aerokit. The performance jump is clear: the Aerokit allows the overall drag - bike and rider - to be lowered by a further 4.5%. A result which, translated into real terms, means greater efficiency, 'free' speed, and a measurable competitive advantage.

The project was not limited to conceptual research. It was completed and industrialised together with the engineers at Elite Cycling, a global leader in the design and production of hydration systems. This partnership has resulted in a kit that combines functionality and performance: 1100 ml of total capacity, optimally distributed and with a minimal aerodynamic impact.



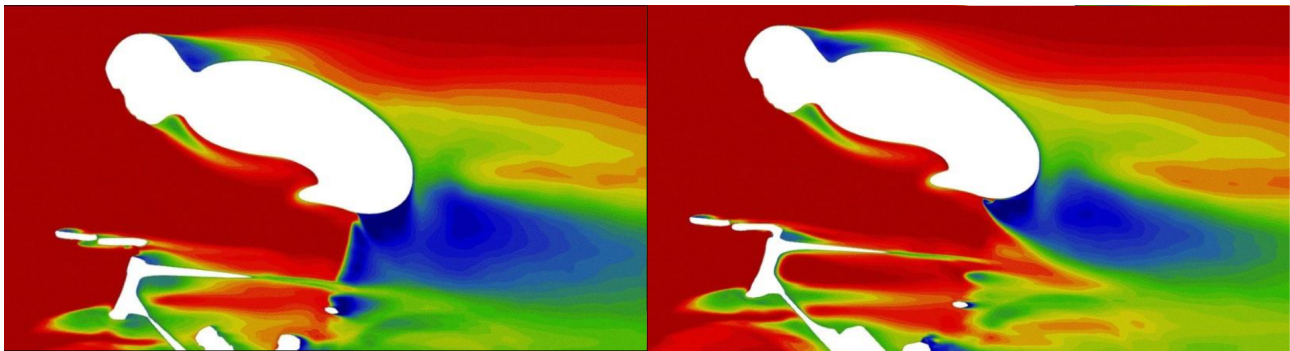
The Aerokit is the result of the integration of six components perfectly studied to work together: two tapered aero water bottles, two dedicated bottle holders, and two coupling bases, specific to the down tube and seat tube of the Filante SLR <sup>ID2</sup>. The latter were designed with distinct geometries to adapt to the different tube profiles, thus creating a single, continuous, and harmonious body with the frame.

A fundamental advantage of the system is its versatility. The Aerokit maintains full efficiency even when the aero water bottles are replaced with traditional round bottles, an essential solution for race situations where external supplies are required. In this case, the overall capacity can even increase: up to 550 ml on the down tube and up to 750 ml or more on the seat tube, without sacrificing the aerodynamic benefits of the integrated design.

## AERODYNAMIC SEATPOST AND NEW SHIMANO DI2 BATTERY HOUSING

Designing a truly aerodynamic seatpost is an exercise in engineering precision. An apparently simple component becomes a difficult puzzle to solve, yet it is crucial for the bike's overall efficiency: its impact on aerodynamics isn't limited to the front surface but is amplified through interaction with the cyclist's alternating leg movement.

With the experience gained in the development of the Supersonica SLR, we already had the right formula: a balance between aesthetics, light weight, and comfort. The new seatpost for the Filante SLR <sup>ID2</sup> originates from this recipe, featuring a slender and sharp profile (38 mm x 16 mm) that optimises aerodynamic penetration without compromising stiffness and vibration absorption. CFD tests confirm this: the new section generates significantly less turbulence than the previous version, translating into a cleaner, more stable airflow around the frame-and-rider system - a central element in Wilier product development.



Filante SLR

Filante SLR ID2

This design choice also led us to rethink the location of the Shimano Di2 battery, which is historically placed inside the seatpost. With such a slender design, an alternative and more efficient solution was necessary. The answer came by moving the battery to the bottom bracket box, where it is encased in a resin housing secured with two screws.

The advantages are immediate and tangible:

- **Accessibility:** the battery can be checked or replaced in a matter of moments, without removing the seatpost or changing the saddle height.
- **Lower centre of gravity:** the new position contributes to lowering the bike's centre of mass, in synergy with the lowered Aerokit. The result is a more stable, precise, and manageable bike when riding at high speeds.

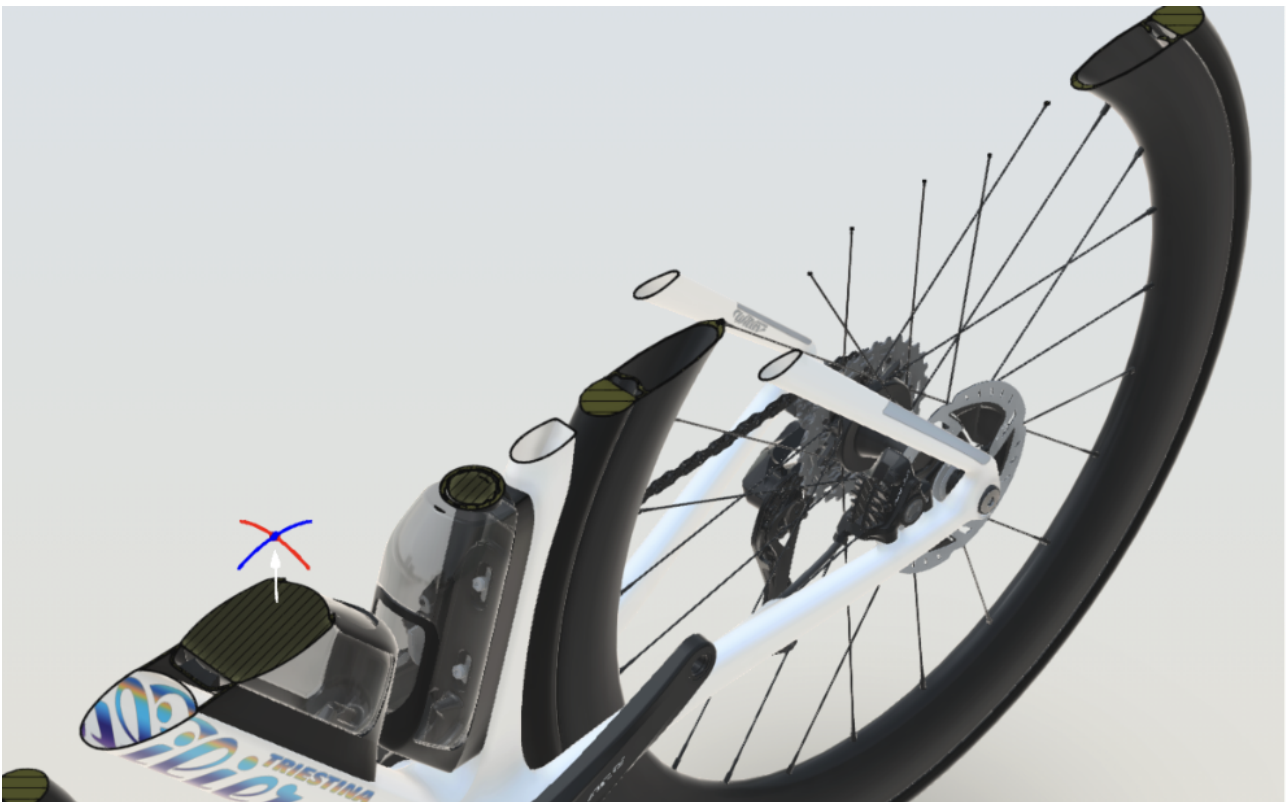
Lastly, a design detail that epitomises the project's philosophy: the protective rubber grommet for the seatpost clamping mechanism is no longer protruding but is integrated flush with the frame. This is a clean and functional solution that enhances the continuity of the top tube silhouettes and underscores the attention to detail - a perfect marriage of function and aesthetics.



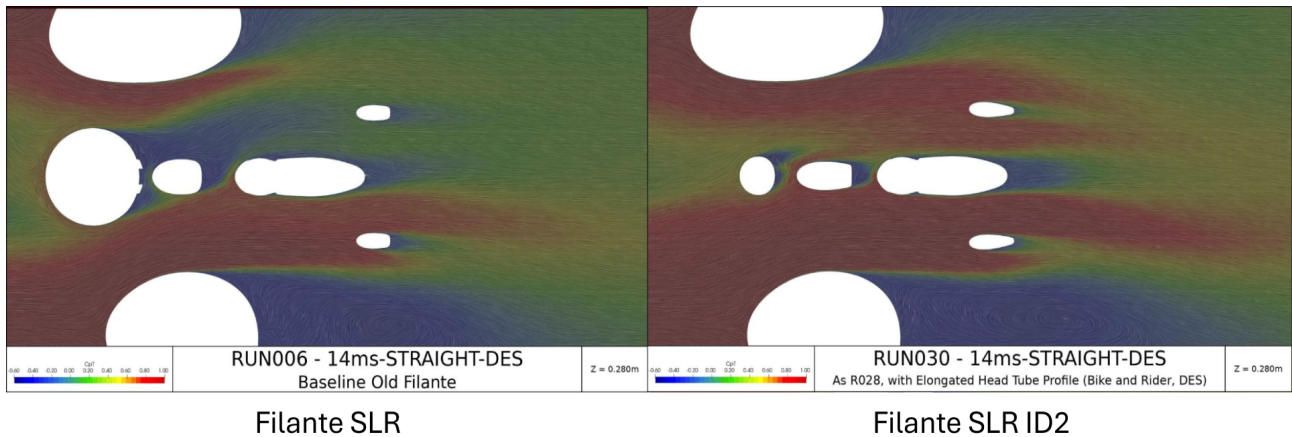
## REAR SEATSTAYS: A SILENT REVOLUTION

We chose to preserve the family feel of the previous Filante, maintaining wide rear stays that join the seat tube with a broken line, which gives the frame a determined character when viewed from behind.

To a superficial eye, they might look similar to the ID1 version, but in actual fact, they have been redesigned in every detail. Analyses of the dynamic interactions between the stays and rider's leg movement during pedalling guided us towards an unexpected solution: inclining the stays inward by 2.5°.



This choice, which appears counter-intuitive, demonstrated clear benefits in the CFD simulations. In the comparison graphs, within the dedicated section, it is clear how the combination of the new lowered water bottle position and the redesigned stays generates a cleaner, more regular flow, with a drastic reduction in turbulence.



Once again, the optimisation of the aerodynamic flow originates from placing the cyclist at the centre: this solution allows us to increase speed further while maintaining the same Watt output from the rider.

## POWERMETER MAGNET HOUSING: AERODYNAMICS IN EVERY DETAIL

The search for marginal gains drove us to rethink even an often-overlooked detail: the position of the powermeter magnet.

We designed a dedicated recess on the rear triangle stay, on the crankset side, intended to house the magnet optimally. Once installed, it is protected by a surface-flush sticker, which makes it practically invisible to the airflow and perfectly integrated into the frame design.

Even when a powermeter is not used, applying the sticker still ensures the same aerodynamic advantages and clean-cut aesthetics of the frame.

This solution, besides improving aerodynamics, guarantees effective protection for the magnet against accidental impacts or chain drops, increasing the overall reliability of the system.

## THE VERDICT FROM THE SILVERSTONE WIND TUNNEL: MEASURABLE PERFORMANCE, REAL ADVANTAGES

The new Filante SLR <sup>ID2</sup> is the result of a meticulous development process, featuring numerous testing sessions and data validation at the prestigious Silverstone wind tunnel. Every step was designed to go beyond CFD simulation, translating the project into concrete, measurable results.

The verdict was unequivocal: reality exceeded the simulation. In the latest test session, the drag reduction for the bicycle alone reached -13.6%, exceeding the -12% estimated by the CFD simulation. Even in the bike-rider system - a central concept for Wilier - the data surprised us: from -3.6% CFD to -4.5% real-world. These figures demonstrate how the Filante SLR <sup>ID2</sup> design achieves its full potential in genuine riding conditions.

But we didn't stop at internal validation. We put our bike in direct comparison with five top-of-the-range models from the main World Tour competitors. Only one managed to come close: compared to the others, the Filante SLR <sup>ID2</sup> registered an average CDA that was 2.42% better. A difference which, at the speeds of professional cycling, means seconds gained, energy saved, and concrete advantages when it truly matters: in the race.

The Filante SLR <sup>ID2</sup> is not just the result of visionary design: it is a race-proven bike, built to win, and capable of transforming science into tangible advantages for the athlete.

## AERODYNAMICS AND LIGHT WEIGHT, THE KEY TO PERFORMANCE

Light weight remains a core pillar for guaranteeing high-level performance. In the design of the new Filante SLR <sup>ID2</sup>, this principle was constantly prioritised. The result is a bike that perfectly combines aerodynamic efficiency and low weight, an indispensable combination in modern cycling.

The combination of aerodynamics and light weight enhances responsiveness and efficiency, reducing fatigue and optimising power management. Performance is thus translated into a concrete advantage for the bike-and-rider system, making the Filante SLR <sup>ID2</sup> extremely versatile, from the toughest climbs to long, flat races. In tests conducted on the bike alone, at 40 km/h there is a saving of 8.9 Watts with standard water bottles and bottle holders, and 9.47 Watts with the Aerokit; values that increase at 50 km/h to 19.13 Watts and 21.20 Watts respectively. The effectiveness becomes even more evident when considering the combined bike-and-rider system: at 40 km/h, the advantage for the rider is 11.51 Watts with standard bottles and 14.15 Watts with the Aerokit, while at 50 km/h, the savings climb to 24.55 Watts and 28.80 Watts.

Translated into real-world performance, this means that in a 70 km time trial at an average of 290 Watts, the cyclist would take 1 minute and 25 seconds less with the new Filante SLR <sup>ID2</sup> equipped with standard bottles, and an impressive 1 minute and 45 seconds less with the Aerokit.

Specific details:

	FILANTE SLR <sup>ID1</sup>	FILANTE SLR <sup>ID2</sup>	DELTA
FRAME WEIGHT (BLACK PAINTED, SIZE M)	860 g ± 5%	860 g ± 5%	=
BB STIFFNESS	187 Nm / °	201 Nm / °	+ 7,49 %
C*dA AT 50 Km/h at 0° <b>BIKE ONLY</b>	0,1016 m²	0,0883 m²	- 13,1 %
C*dA AT 50 Km/h at 0° <b>BIKE + RIDER</b>	0,3465 m²	0,3284 m²	- 5,22 %
C*dA AT 50 Km/h at 15° <b>BIKE + RIDER</b>	0,3753 m²	0,3564 m²	- 5,04 %
WATT AT 40 Km/h	287,95 W	273,8 W	- 4,91 %
70 Km at 290 W	1:45:00	1:43:15	- 1' 45"

## GEOMETRIES DEVELOPED DIRECTLY WITH PROFESSIONALS

The geometries of the new Filante SLR <sup>ID2</sup> are the result of direct collaboration with the Groupama-FDJ World Tour team, with the aim of refining every detail of the frame while maintaining the AccuFit approach. This system guarantees continuity and uniformity in the fitting range of all configuration points, ensuring every cyclist has the same fitting precision, regardless of frame size.

Compared to the previous version, several key updates have been introduced:

- The rear triangle has been slightly lengthened: a choice that allows for better integration of the new transmission groupsets with the UDH dropout, increases tyre clearance (up to 34 mm), and improves the overall stability of the bicycle.
- The Reach & Stack graph is less steep and more “stretched”, expanding the fitting coverage and particularly improving the small and large sizes.
- New handlebar bend design, with geometries also dedicated to the Asian market.

A dedicated handlebar corresponds to each frame size, with specific length and width. There are 6 available sizes:

- XS > 75 - 35/38
- S > 90 - 37/40

- M > 100 - 37/40
- L > 110 - 37/40
- XL > 110 - 39/42
- XXL > 120 - 39/42

The reach and drop remain constant across all variants, while uniform ergonomics are also maintained in the low grip (AccuFit point C1). This means the riding position remains consistent and balanced across all configurations.

In other words, the result is a practically bespoke fitting, capable of adapting to every cyclist with millimetric precision.

## THE CULTURE OF SPEED, WILIER TRIESTINA'S CREED

The Filante SLR <sup>ID2</sup> represents the evolution of an idea: to gift the cyclist the fastest version of themselves. From the NACA airfoils of the fork and the new AeroKit to the redesigned seatpost, the perfect integration of the Shimano Di2 battery, and the geometries developed alongside World Tour champions. Every element converges towards a precise goal: to offer scientifically validated performance, measurable advantages, and authentic feelings on the road.

But the Culture of Speed goes beyond the numbers. It is a philosophy that has guided our way of building bicycles for 120 years. This culture drives every project, pushing us beyond performance for its own sake towards conscious research that unites experience, genius and technology. Our goal is perfect motion: that harmonious balance between rider and bicycle where force, precision, aesthetics, and function merge.

With the Filante SLR <sup>ID2</sup>, we transform data into emotion. The numbers do not represent the finish line, but the starting point for creating bicycles that truly communicate with those who ride them. This is how we keep to a promise that has always accompanied us: to create the means for you to become the fastest version of yourself.