TECH AND FACTS REPORT

SCOTT PLASMA 5 | 2015

SCOTT

PLASMA 5 CONCEPT

AERODYNAMICS

The Plasma 5 has been designed to be faster with the rider than without. A moving rider creates a substantial influence on the airflow around the bike and ultimately on the aerodynamic performance. Despite the extra effort required to examine this complex phenomenon, it was closely considered during the development process of the Plasma 5 and had a major influence on the frame design.

ERGONOMICS

To a large degree, the position of the rider on the bike determines riding performance. The position of the rider directly influences the force distribution during the pedal stroke and consequently determines pedaling efficiency while the position of the rider's upper body directly affects aerodynamic drag. An aerodynamically positioned torso will lower drag therefore improve aerodynamic performance. Saddle and handlebar adjustability were in effect a major topic during the developmental phase. Considering the idea that this bike would be ridden by riders of all shapes and sizes, from World Tour riders to long-distance triathletes, the Plasma 5 offers a wide range of adjustability to follow suit.

VERSATILITY

The Plasma 5 has been developed to match the needs of triathletes and cyclists alike. While a wide range of adjustability and a modular stem/bar concept ensures that the position requirements of both triathletes and cyclists are sufficiently covered with the same bike, triathletes benefit from a sophisticated storage system. With the exception of the triathlon-specific storage box and an Aero Drink bottle, the Plasma 5 is fully UCI-compliant and can be used in competitions for both sports without restrictions.

FUEL STORAGE

Long distance triathletes spend several hours on their bike before switching to the running segment. While aerodynamics and ergonomics are key factors for a fast and efficient bike split, nutrition and hydration are essential to maintain a high pace during both the bike and running legs. With this in mind, the engineering team developed a sophisticated storage system that stands above the rest due to its high degree of usability, while not hampering the aerodynamics of the bike nor the ergonomics of the rider.

THE PLASMA 5 WAS DESIGNED TO ENABLE AN AERODYNAMIC FUSION BETWEEN RIDER AND BIKE. BE IT AN AERODYNAMIC FRAME DESIGN THAT TAKES INTO CONSIDERATION THE INTERACTION BETWEEN A MOVING RIDER AND THE BIKE, AN ERGONOMICALLY AND PURPOSE DRIVEN HANDLEBAR THAT OFFERS A WIDE RANGE OF ADJUSTABILITY OR THE PRACTICAL IMPLEMENTATION OF FUEL STORAGE, THE PLASMA 5 TAKES EXTRA STEPS TO MAKE BIKE AND RIDER ONE.

THE AERODYNAMIC EXPERTS

Benoît Grelier, **Engineer**

"Wide range adjustability especially on the front-end of the bike is key if your goal is to cover the needs of both UCI World Tour cyclists and Ironman Hawaii podium contenders with only one frame."

Frank Oberle, **Product Manager**

"We assessed the current fuel systems on the market and soon realized that we would need to come up with a novel solution to fully meet the needs of long distance triathletes."

Simon Smart, **Technical Director, Smart Aero Technology**

"The influence of the moving rider on airflow and hence frame aerodynamics is a complex phenomenon but definitely needs to be considered when pursuing the goal of developing a high-performance Triathlon and TT-bike."

Sebastian Kienle, **two-time Ironman 70.3 World Champion**

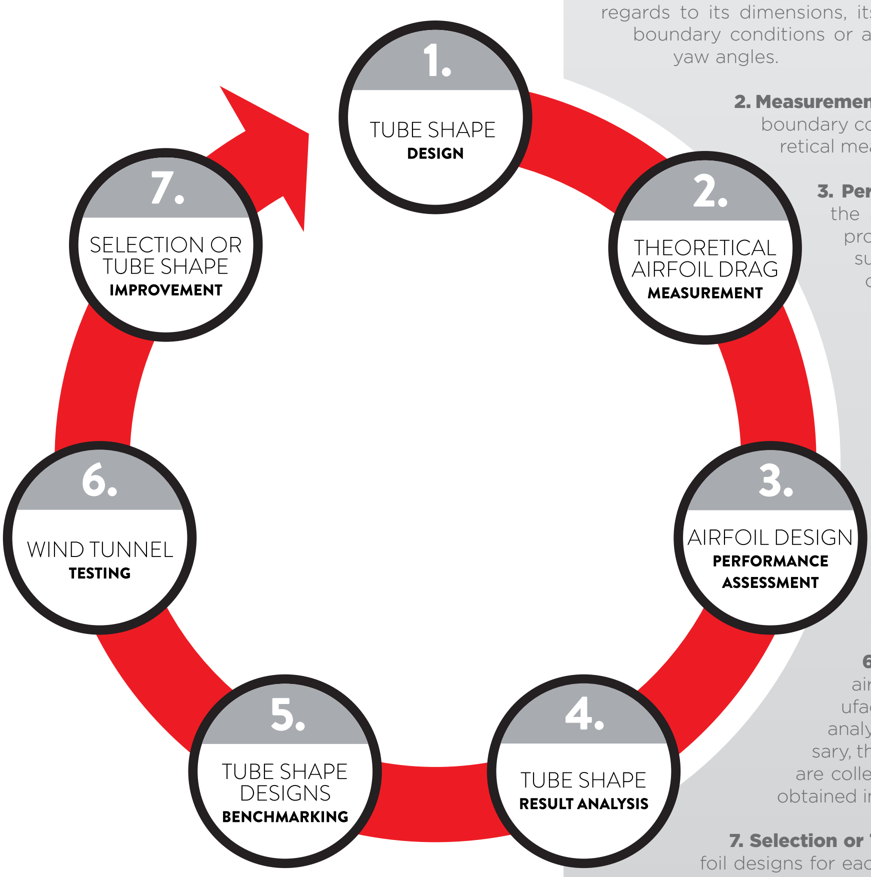
"During the countless feedback and testing sessions with the engineering team I didn't think incorporating all of my feedback into the Plasma 5 would be possible. Yet, they did it - novel aerodynamic frame properties, almost unlimited adjustability and a flawless hydration and nutrition storage system – the Plasma 5 has it all!"

SCOTT AERODYNAMIC SCIENCE

When the Plasma 3 project was initiated back in 2009, a team of several engineers was created that was fully dedicated to scientific research in aerodynamics along with the development of products based on the gathered findings. Over the past few years, the engineering team has spent a lot of time to turn their research into class-leading products. After the successful introduction of the Plasma 3 Triathlon and Time Trial bike, the aero engineers translated their knowledge into an aerodynamically optimized road bike, the Foil. The Foil was successfully used in countless races by the vast majority of SCOTT's World Tour riders. The Plasma 5 constitutes the latest innovation from SCOTT's Aerodynamic Science unit.

ITERATIVE DEVELOPMENT PROCESS

SCOTT's Aerodynamic Science unit applies a cyclical design process to the development of products. The more iterations are run in an cyclical design process, the more precise the results are. When developing the Plasma 5, three complete iterations were run. A major advantage of this process is the combination of theoretical results with results measured in real-world conditions. First, design concepts are virtually tested by means of CFD analysis. Second, the results obtained from CFD analysis are validated in the wind tunnel under simulated real-world conditions. While in the first wind tunnel test the bike designs are tested under isolated circumstances, further testing follow that included mannequins, actual riders, and a number of environmental variables to ensure accurate test results reflecting real-world riding conditions.



1. Tube Shape Design: Whether it is from scratch or from previous development, the tube shape is designed with the goal of optimising the airfoil performance with regards to its dimensions, its direct environment (e.g. component interactions, boundary conditions or airflow type) and to the broadest possible range of yaw angles.

2. Measurement of Theoretical Airflow Drag: The input of particular boundary conditions into the CFD software results in a first theoretical measurement for each tested yaw angle.

3. Performance Assessment of Airfoil Design: Based on the air resistance values collected during the previous process step, typical airfoil aerodynamic characteristics such as Drag Coefficient ( ), Lift Coefficient ( ) and the overall tube drag values are calculated and assessed.

4. Analysis of Tube Shape Results: The obtained drag and lift results are summarized in graphs. Based on analysis of the graphs, airfoil design particularities such as low vs. high yaw angle performance, airflow separation points or wake are determined.

5. Benchmarking Tube Shape Designs: The drag and lift results of the different airfoils are compared to each other. SCOTT's proprietary A4 software allows for the simulation of real-world conditions in the process of analysing the performance of the airfoils. Based on the benchmark results, a first airfoil selection is made.

6. Wind Tunnel Testing: All performing or interesting airfoil designs are selected and profile samples are manufactured. These samples are tested in the wind tunnel to analyse the airflow behavior at every yaw angle. If necessary, the profiles are modified with filling material. The results are collected and compared to the theoretical performances obtained in previous steps and are benchmarked once again.

7. Selection or Tube Shape Improvement: The best performing airfoil designs for each frame area are selected and implemented accordingly. In case some of the airfoils have been modified during the wind tunnel test, the tube design is updated and another loop begins.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PLASMA 5 TECHNOLOGIES

AIRFOIL INNOVATION

The airflow that meets the bike when in motion has different boundary conditions depending on the area of the frame as it may have been disturbed by components and/or moving elements such as the wheels or the rider's body. The seat tube region for example, is a complex area in this regard, as it is close to the spinning rear wheel, moving rider's legs and crank set. In this area, the airflow velocity, its direction and its pressure are different from those encountered in the headtube area, for example, where neither components nor parts of the rider's body disturb the airflow before meeting the frame. As a result, the airfoil design of different aerodynamically relevant frame regions needs to be modified according to the airflow conditions that occur in these areas. Therefore the engineering team developed an airfoil concept with a set of variable parameters that can be customised for every airflow characteristic in each aero zone of the frameset. The F01-X230 parametric airfoil features excellent aerodynamic properties.

In areas where undisturbed airflow meets the bike the truncation ratio of the leading edge and the transition radius are increased and the trailing edge is decreased. Airfoil designs with modifications as illustrated above are used in areas such as the upper down tube, headtube and the handlebar where "clean" airflow conditions occur.

In areas where perturbed airflow meets the frame (e.g. seat tube, chain stays or lower down tube) the F01-X230 airfoil features a decreased truncation ratio and transition radius and an increased trailing edge that might even be flat in the most extreme case. This early truncation has two main advantages. First, the airflow is detached early enough to avoid airflow interactions and to prevent any airflow reattachment from occurring too early. Elements positioned behind these airfoils benefit from its wake and are "shielded" and protected from the wind, which lowers the overall drag of the bike-rider system. Second, these airfoils decrease high pressure areas. When in motion, the front wheel creates airflow that runs in the opposite direction than the airflow that circulates around the fork blade due to the propulsion of the bike. If these airflows meet, they create high pressure zones which increases drag and can cause downwash. The early truncation on the fork blades allows a reduction of the airfoil chord length without compromising aerodynamics while reducing high pressure zones.

PLASMA 5 TRI

7%

AVERAGE DRAG REDUCTION COMPARED TO PLASMA 3

PLASMA 5 TT

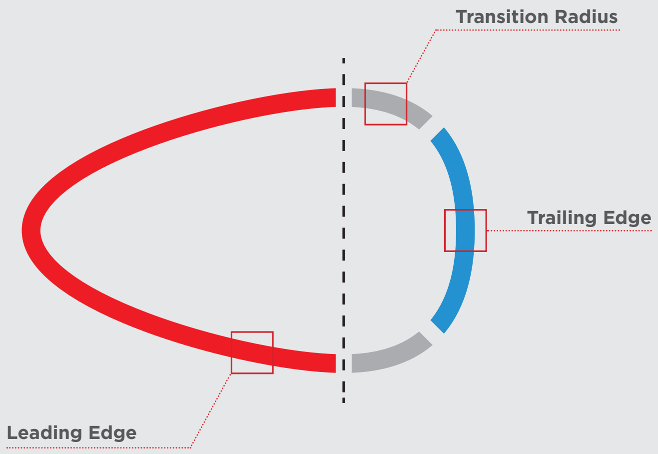
5%

AVERAGE DRAG REDUCTION COMPARED TO PLASMA 3

3 | COMPLETE PROCESS LOOPS

SCOTT **AERODYNAMIC SCIENCE**

AIRFOILS EXPLAINED



Leading Edge:
In this section the airflow will first meet the airfoil.

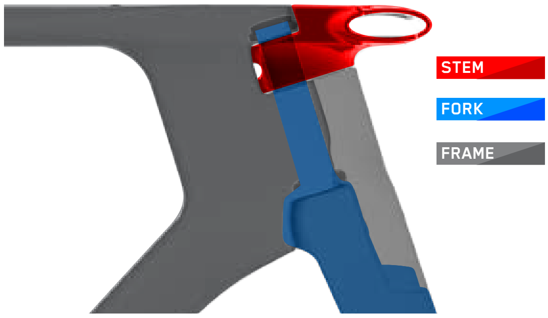
Transition Radius:
This section consists of a convex shape, usually a circular-arc segment that is intended to build a transition between the leading edge and the trailing edge.

Trailing Edge:
This section consists of a convex shape, usually a circular-arc segment that either determines the detachment of the airflow or enables an optimal airflow transition to an element that is positioned behind the airfoil.

The F01-X230 parametric airfoil implemented on the Plasma 5

STEM INTEGRATION

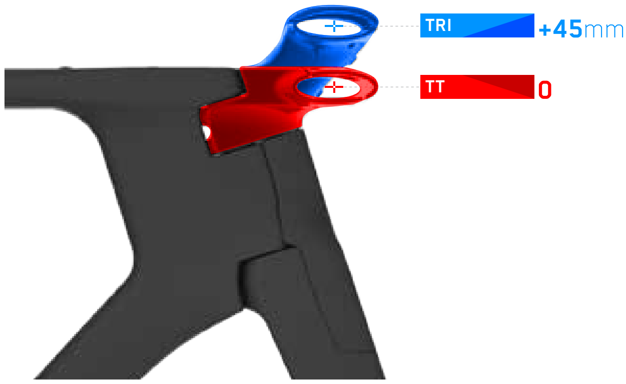
The engineers at SCOTT have identified 5 key performance features of the stem-headtube construction on a TT/Triathlon bike: adaptability, aerodynamics, stiffness, weight and integration. When all five performance factors are taken into consideration, stem integration is an elaborate topic. Few solutions for the headtube and stem construction currently on the market achieve an uncompromised combination of the above illustrated performance features. A novel solution was required to cover these features without compromises. The assessment of different design solutions led to the selection of a construction in which the stem is attached to the steerer tube in between the bearings. This solution allows for the following advantages:



Integrated headtube and stem design concept

ADAPTABLE

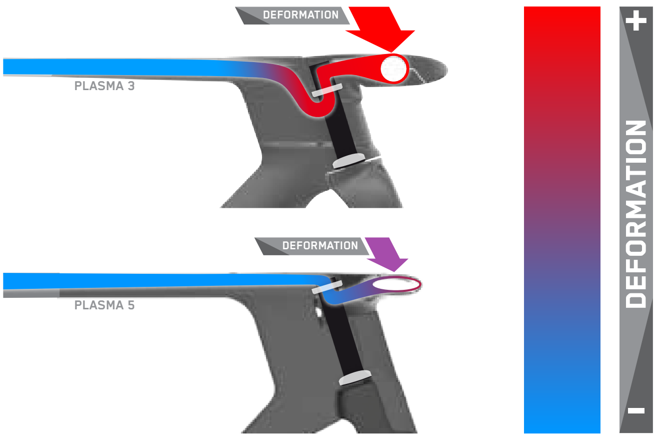
For the Plasma 5 there are two stem options available: while the TT stem stays in line with the top tube and allows for a very low position on the bike the riser stem (Triathlon configuration) increases handlebar stack by 45mm while maintaining the reach of the TT stem and allows for the installation of the clip-on Aero Drink.



TT vs. Triathlon stem on the Plasma 5

STIFF

Thanks to the standard inner steerer tube construction and because the distance between the upper and lower bearings is optimised – upper and lower bearings are positioned at both ends of the headtube – the construction increases headtube torsional stiffness substantially. The monobloc construction of the stem and its closed body design allows for a stiffer connection between handlebar and frame than that of adjustable or modular stems. In addition, the new stem design features a more direct connection between the stem and the frame compared to the previous construction on the Plasma 3. The force applied to the handlebar when pedalling out of the saddle is transferred through a direct path that reduces deflection of the steerer tube and headtube. Overall the headtube torsional stiffness has been improved by 47% compared to the Plasma 3.



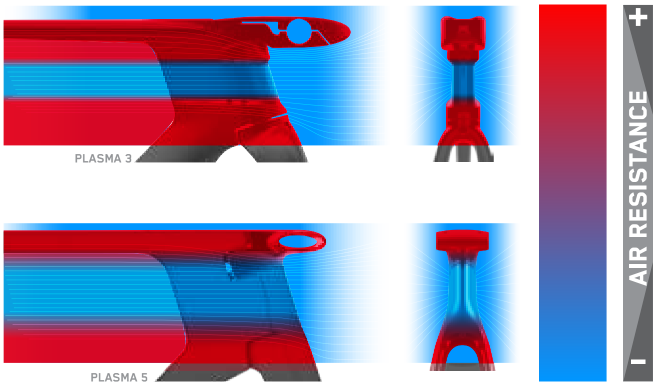
Stiffness benefits of the new headtube design: on the Plasma 5 the stem and frame are directly linked which improves stiffness substantially and benefits power transfer and direct handling.

LIGHTWEIGHT

unlike external steerer tubes, the standard steerer tube construction does not require considerable reinforcement to resist the strong lateral and frontal loads applied on the fork. Moreover, the stem design on the Plasma 5 which features a direct link between the fork and stem has a lower overall weight compared to existing solutions. Despite the increased complexity of the frame construction featuring a direct connection between the frame structure, the bearings and the stem, fewer reinforcements are required for the top tube, headtube and down tube areas compared to existing solutions. While there is no weight penalty on the frame itself the new stem design saves about 90g compared to the stem of the Plasma 3.

AERODYNAMIC

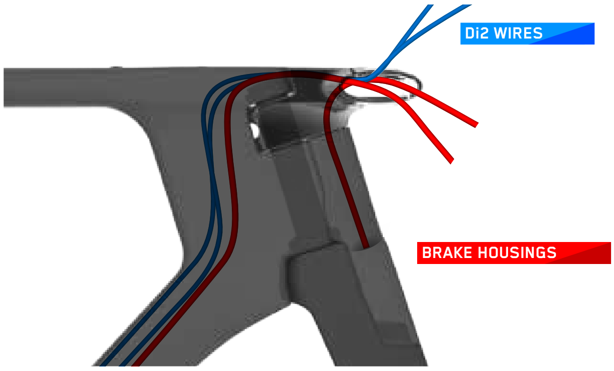
The upper bearing is positioned behind the upper part of the stem. In a low stem configuration, the upper bearing is in line with the stem and the top tube. Consequently, there is no need to widen the headtube to optimize airflow around the upper bearing as the stem is already covering the bearing. Unlike many typical standard steerer tube constructions where the frame's leading edge is not aerodynamically optimised, the front brake cover plays the role of an aerodynamic fender and improves the aerodynamic properties of the leading edge.



The new headtube and stem construction optimizes airflow and decreases aerodynamic drag.

INTEGRATION

The upper part of the new stem allows for internal cable routing: the front and rear brake cable housings and the shifting wires are routed out of the handlebar



Internal cable routing at the front end of the Plasma 5

-90G

COMPARED TO THE PLASMA 3 STEM

+47%

HEADTUBE TORSIONAL STIFFNESS COMPARED TO THE PLASMA 3

+45MM

STACK INCREASE WITH RISER STEM

PLASMA 5 AERIA HANDLE BAR

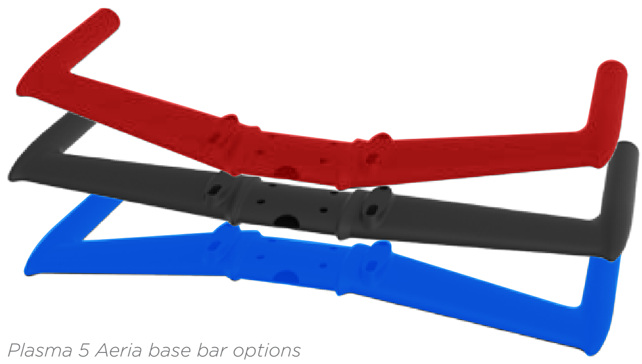
The upper body position is the most important factor when it comes to aerodynamic performance of the bike-rider system. At the same time, the upper body position needs to be ergonomic as the rider has to maintain this position up to several hours when competing in a long distance triathlon. For the Plasma 5 SCOTT partnered with the renowned handlebar manufacturer Profile Design. This partnership allowed for the development of a handlebar concept that features a wide range adjustability, a high-degree of compatibility, allows for proper integration of cables and wires and incorporates the airfoil innovation of the Plasma 5.

BASE BAR

The base bar has been specifically designed for the Plasma 5 and features an ultra-flat clamping area while the cross-sectional bar profile features the F01-X230 airfoil. In addition, the base bar allows for a complete integration of brake housings and electronic shifting wires. Amongst all the bars that were tested the Plasma 5 Aeria proofed to be the best with regard to aerodynamic performance. At the same time, the bar features a very stiff construction to ensure immediate power transfer. It complies with the 3:1 UCI rule and can thus be used during UCI events. To ensure optimal fit, SCOTT offers three different base bars:

- **+30mm rise/420mm width (c-c): designed for tall riders and riders that ask for a more upright body position.**
- **Flat/420mm width (c-c): matching fit for the majority of rider's competing in triathlons and time trials.**
- **-30mm drop/400mm width (c-c): specifically designed for small sizes and very low handlebar positions.**

All three base bars feature a longer reach than standard base bar models. The reach can be cut by up to 15mm to make sure the rider can achieve their preferred base bar reach. In addition, the bar sweep is kept at a minimum for sufficient knee clearance when pedalling out of the saddle.



Plasma 5 Aeria base bar options

3	22.2MM	75MM
BASE BAR OPTIONS AVAILABLE	BRACKET DIAMETER COMPATIBLE WITH ALMOST ANY EXTENSIONS AVAILABLE	HEIGHT ADJUSTMENT WITH SPACER

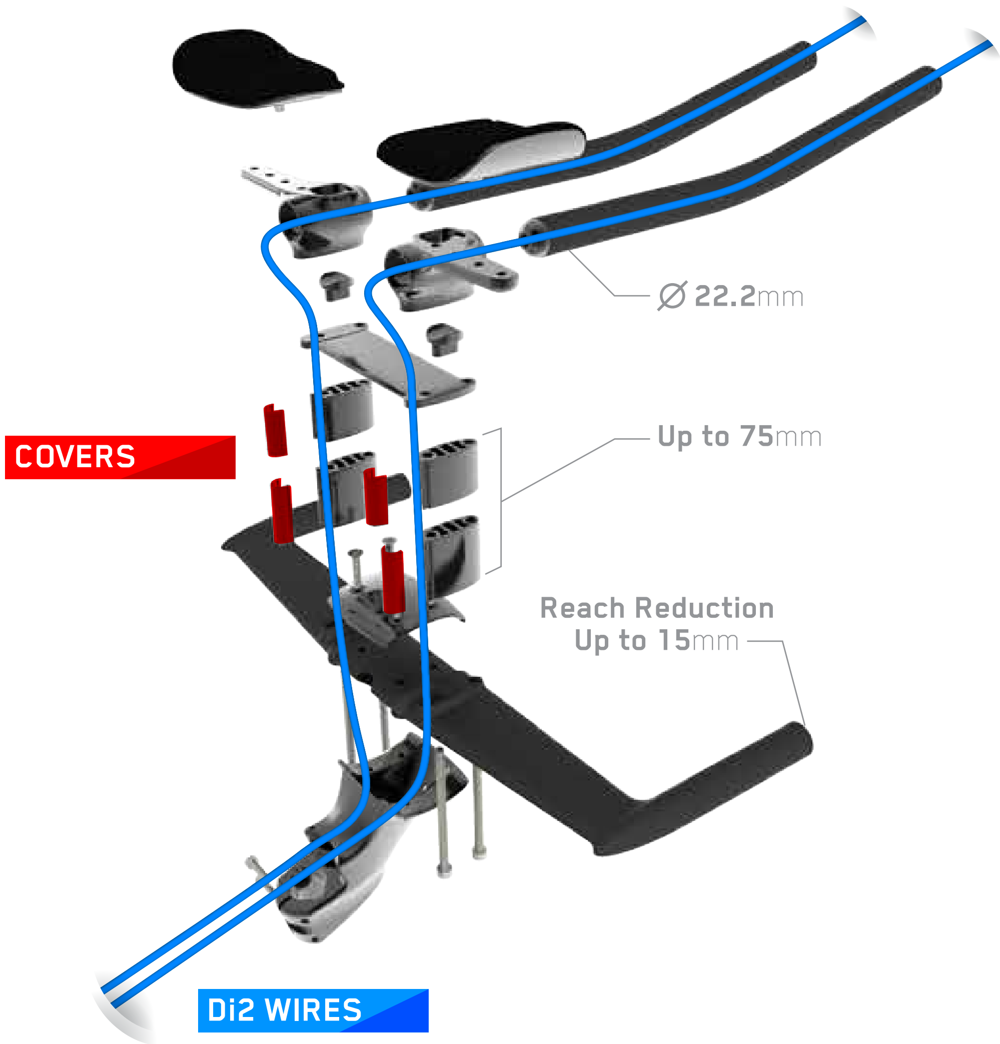
SPACERS AND EXTENSION BRACKET

The spacer and extension brackets have been designed specifically for the Plasma 5 and allow for a height adjustment of up to 75mm for the arm rests and extensions. The trailing edge of the spacer features a removable cover that provides easy access to the internal channel where the electronic shifting cables are routed.

The extension clamping system features a Ø22.2mm (7/8") clamping standard to maintain interchangeability with all of the available extension from Profile Design and most other brands.

EXTENSIONS AND ARM RESTS

Profile Design developed a new extension and arm rest kit that perfectly matches the needs of Sebastian Kienle and many other professionals. The sweep bend extension is angled at its end in order to provide an ergonomic but more aerodynamic hand position due to the reduction of the gap between extension and forearm. The new pad construction features a narrower mounting option and a lower pad design. The new design improves the aerodynamic performance of the bike's front end while maintaining the same comfort, adjustment range and handling precision.

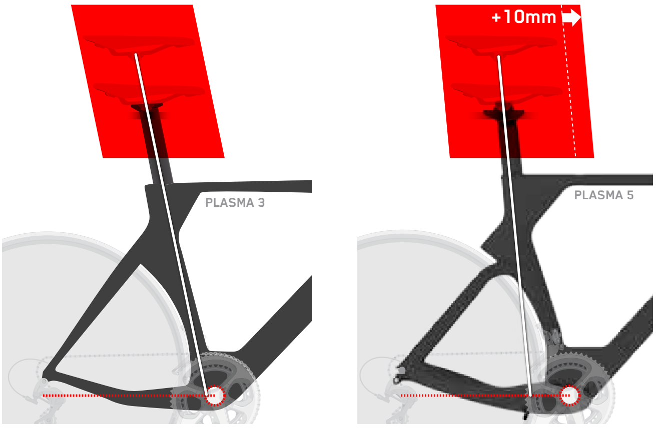


Exploded view of the stem and Aeria handle bar

SEAT CLAMP ADJUSTABILITY AND SEAT POST OFFSET

Compared to the Plasma 3, the seat post of the Plasma 5 is not in line with the seat tube but rather at an angle. The resulting saddle clamp adjustment range remains almost identical independent of saddle height. In addition, the seat post has been modified and features an additional 10mm of horizontal adjustment.

+10MM | HORIZONTAL SEAT CLAMP ADJUSTMENT OF THE PLASMA 5 SEATPOST



Saddle adjustement range comparison between Plasma 3 and Plasma 5

MULTI-FUEL AERO STORAGE

Hydration and nutrition storages are key features on Triathlon bikes, especially for long distance races. The engineers at SCOTT have therefore dedicated part of the project to the integration of (fuel) storage for the triathlon version of the Plasma 5. Most of the currently available systems are aftermarket products that can be installed on almost every bike but are inevitably limited in many areas. After an extensive assessment of different solutions, the development team decided to go for a vertical bottle design which is mounted below the extensions, in front of the headtube and for a storage box which can be installed on the top tube right behind the stem. These storage systems offer a high usability due to easy installation, refilling and cleaning. Both storage systems are located on the bike in a way that the rider can access them without leaving the aero position. The storage systems are removable and only need to be installed on the bike when actually used. After all, the storage system improves the overall aerodynamic performance of the Plasma 5 with the triathlon configuration.

Multi-fuel storage system on the Plasma 5

PLASMA 5 AERO DRINK

In further collaboration with Profile Design, the engineers developed a novel aerodynamic hydration system. The aero drink features a clip-on connection which allows for installation and removal of the bottle in a matter of seconds. While the clip-on connection ensures a firm fixation to the stem, the bottle offers a secondary connection to the front brake cover. This secondary connection features a soft interface that avoids vibrations and movements. The hydration system offers a low-weight body from dishwasher-safe material with a large filling opening to save time while refilling and ensuring compatibility even with the widest bottle caps. A smooth bottle-frame intersection lowers aerodynamic drag due to an optimized airflow recirculation behind the bottle.

STORAGE BOX

The storage box features a two-cell design which allows for the separation of different contents (e.g. bars/gels or new content/waste). The divider is removable in order to allow for a single, large storage compartment as well, offering space for up to 8 energy bars. The storage box features a solid body shell to optimize airflow while offering enough knee clearance for the rider. The rubber top cap grants easy access and ensures washability while drain holes at the bottom of the box prevent water accumulation on the inside. The storage box offers a standard 64mm assembly bolt interface and can be replaced with a standard bottle cage.

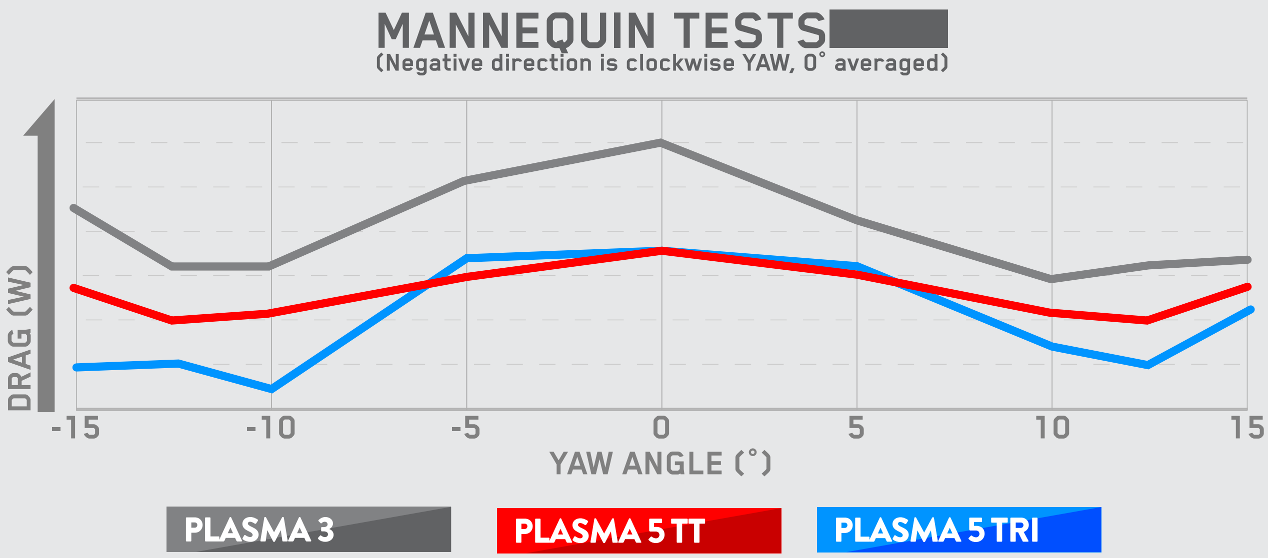
S (550ML) / M (625ML)
SIZE-SPECIFIC AERO DRINK VOLUME

2 CELL DESIGN
OF THE STORAGE BOX
REMOVABLE DIVIDER

UP TO 8
ENERGY BARS STORAGE BOX VOLUME

AERO ADVANTAGE

THE TRIATHLON CONFIGURATION OF THE PLASMA 5 USES THE RISER STEM AND THEREFORE PROVIDES A HIGHER BAR POSITION WHICH IS NO LONGER IN LINE WITH THE TOP TUBE. WITHOUT ANY ADAPTATIONS THIS WOULD IMPEDE THE AIRFLOW IN THE TOP TUBE AREA. THE HYDRATION SYSTEM AND THE STORAGE BOX OPTIMIZE THE AIRFLOW AROUND THE TOP TUBE AREA AS WELL AS THE FRONTAL SURFACE AS A RESULT OF THE MOUNTED HYDRATION SYSTEM. MOREOVER, THE INSTALLATION OF THE HYDRATION SYSTEM IN FRONT OF THE HEADTUBE PROVIDES A LONGER LEADING EDGE, REDUCING THE HIGH PRESSURE ZONES ON THE LEADING EDGE IMPROVING AERODYNAMIC PERFORMANCE. WIND TUNNEL TESTING REVEALED SIMILAR DRAG RESULTS FOR THE TT AND TRIATHLON CONFIGURATION OF THE PLASMA 5 AT LOW YAW ANGLES (-7° TO +7°) WHILE AT HIGHER YAW ANGLES THE TRIATHLON CONFIGURATION PROVED TO HAVE EVEN BETTER AERODYNAMIC PERFORMANCE THAN THE TT CONFIGURATION. COMPARED TO THE PLASMA 3, WE SEE AN AVERAGE DRAG REDUCTION OF 7% FOR THE TRIATHLON VERSION AND 5% FOR THE TT VERSION OF THE PLASMA 5.



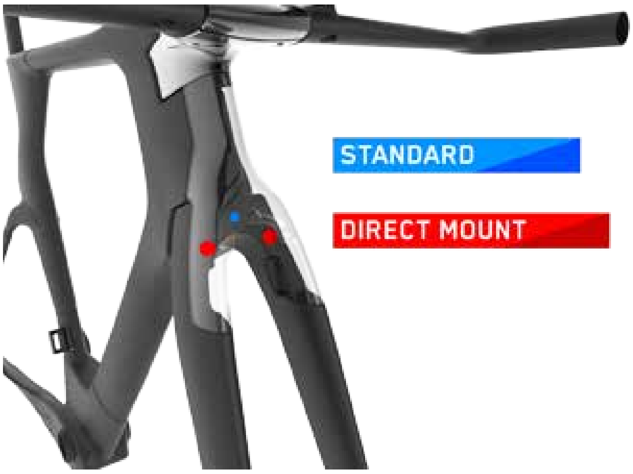
Wind tunnel test results: Plasma 3 (grey), Plasma 5 TT (red) and Plasma 5 TRI with Aero Drink and Storage Box (blue)

BRAKE INTEGRATION

The Plasma 5 features integrated front and rear brakes. The assessment of different brakes available on the market led the engineers to choose a standard Shimano direct-mount rear brake as it offered the best performance while matching the construction of the Plasma 5. For the front brake, however, the existing solutions did not match the expectations of the development team. The influence of the front brake on aerodynamic performance is more significant compared to the rear brake. The front brake design is largely determined by aerodynamic objectives. Although aerodynamic performance is key, the construction shouldn't be made at the expense of braking performance or adjustability. The development team chose to go for a dual pivot / center pull front brake design due to its aerodynamic efficiency, its ability for integration and its overall braking efficiency. The center pull makes it easy to design a front cover that is an aerodynamic appendix and allows for an efficient leading edge of the headtube. This also saves some weight as this leading edge is no longer a structural part of the frame. The Plasma 5 front brake was developed in collaboration with brake manufacturer TEKTRO. The cooperation with TEKTRO resulted in a high-performance brake calliper that is compatible with most of TEKTRO's hardware, facilitating maintenance. While the aerodynamic performance of this construction is beyond doubt, the braking performance has been improved drastically by means of the following modifications. First, the brake features an improved leverage ratio due to the increased length of the lever arms. At the same time, this modification results in a wider range of pad travel within a stable and efficient leverage ratio. Second, the brake features a stiffer construction thanks to a brake booster that keeps the brake bolts from flexing under loads and a dual-lever arm construction that lowers the torsional stress within the lever arm. Third, a lower building construction saves volume for the brake cover design and improves the aerodynamic properties while at the same time increasing the leverage ratio. After all, the front brake mount is designed to fit the latest Shimano Direct Mount interface, meaning that any direct mount brake can be assembled on the new Plasma 5. Additionally, the fork features the standard brake interface, which means any brake with a standard design can be retrofitted on the Plasma. In both cases, however, the brake cover cannot be fitted on the front end.

2 FRONT BRAKE MOUNT INTERFACES

COMPATIBLE WITH DIRECT MOUNT AND CALIPER BRAKES



The different brake mount options are highlighted in red (Direct Mount) and blue (Caliper)

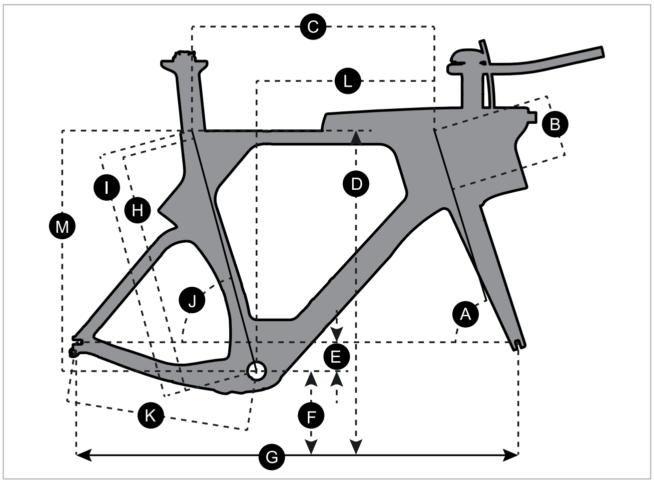
INTERNAL CABLE ROUTING FOR ELECTRONIC

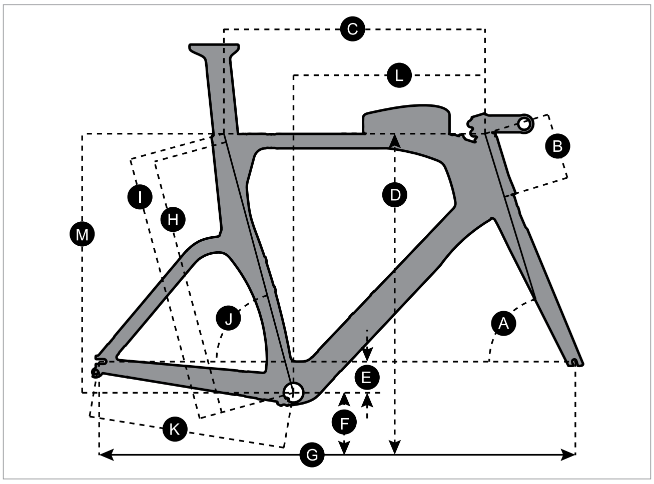
The Plasma 5 frame is compatible with both electronic and mechanical groupsets. The frame offers internal cable routing from the extension to the rear derailleur and an internal battery mount in the seat post.

UCI-COMPLIANT

The Plasma 5 frame and fork with both TT and Triathlon stem configurations is fully UCI-compliant. However, the Plasma 5 Aero Drink and the Storage Box have been designed to cover the specific needs of triathletes and are not UCI-compliant.

GEOMETRY





PLASMA: TEAM ISSUE, PREMIUM

PLASMA: 10, 20

PLASMA: TEAM ISSUE, PREMIUM

		S/51		M/54		L/57		XL/60	
A	HEAD TUBE ANGLE	72.0 °		73.0 °		73.0 °		73.5 °	
B	HEAD TUBE LENGTH	110.0 mm	4.3 in	138.0 mm	5.4 in	170.0 mm	6.7 in	199.0 mm	7.8 in
C	TOP TUBE HORIZONTAL	524.0 mm	20.6 in	544.0 mm	21.4 in	564.0 mm	22.2 in	583.0 mm	23.0 in
D	STANDOVER HEIGHT	779.0 mm	30.7 in	809.0 mm	31.9 in	839.0 mm	33.0 in	869.0 mm	34.2 in
E	BB OFFSET	-65.0 mm	-2.6 in	-65.0 mm	-2.6 in	-65.0 mm	-2.6 in	-65.0 mm	-2.6 in
F	BB HEIGHT	269.0 mm	10.6 in	269.0 mm	10.6 in	269.0 mm	10.6 in	269.0 mm	10.6 in
G	WHEEL BASE	965.0 mm	38.0 in	983.0 mm	38.7 in	1,009.0 mm	39.7 in	1,029.0 mm	40.5 in
H	BB CENTER TO TOPTUBE CENTER	514.8 mm	20.3 in	544.6 mm	21.4 in	574.4 mm	22.6 in	604.2 mm	23.8 in
I	BB CENTER TO TOP OF SEATTUBE	529.8 mm	20.9 in	559.6 mm	22.0 in	589.4 mm	23.2 in	619.2 mm	24.4 in
J	SEATTUBE ANGLE	74.0 °		75.0 °		75.0 °		76.0 °	
K	CHAINSTAY MIN.	403.0 mm	15.9 in	403.0 mm	15.9 in	403.0 mm	15.9 in	403.0 mm	15.9 in
L	REACH	380.0 mm	15.0 in	397.0 mm	15.6 in	414.0 mm	16.3 in	430.0 mm	16.9 in
M	STACK	510.0 mm	20.1 in	540.0 mm	21.3 in	570.0 mm	22.4 in	600.0 mm	23.6 in
N	STEM LENGTH	85.0 mm	3.3 in	85.0 mm	3.3 in	85.0 mm	3.3 in	85.0 mm	3.3 in

PLASMA: 10, 20

		S/51		M/54		L/57		XL/60	
A	HEAD TUBE ANGLE	72.0 °		73.0 °		73.0 °		73.5 °	
B	HEAD TUBE LENGTH	100.0 mm	3.9 in	128.0 mm	5.0 in	159.0 mm	6.3 in	199.0 mm	7.8 in
C	TOP TUBE HORIZONTAL	526.0 mm	20.7 in	546.0 mm	21.5 in	566.0 mm	22.3 in	583.0 mm	23.0 in
D	STANDOVER HEIGHT	769.0 mm	30.3 in	799.0 mm	31.5 in	829.0 mm	32.6 in	869.0 mm	34.2 in
E	BB OFFSET	-65.0 mm	-2.6 in	-65.0 mm	-2.6 in	-65.0 mm	-2.6 in	-65.0 mm	-2.6 in
F	BB HEIGHT	269.0 mm	10.6 in	269.0 mm	10.6 in	269.0 mm	10.6 in	269.0 mm	10.6 in
G	WHEEL BASE	965.0 mm	38.0 in	983.0 mm	38.7 in	1,009.0 mm	39.7 in	1,029.0 mm	40.5 in
H	BB CENTER TO TOPTUBE CENTER	504.9 mm	19.9 in	534.7 mm	21.0 in	564.4 mm	22.2 in	604.2 mm	23.8 in
I	BB CENTER TO TOP OF SEATTUBE	519.9 mm	20.5 in	549.7 mm	21.6 in	579.4 mm	22.8 in	619.2 mm	24.4 in
J	SEATTUBE ANGLE	74.0 °		75.0 °		75.0 °		76.0 °	
K	CHAINSTAY MIN.	403.0 mm	15.9 in	403.0 mm	15.9 in	403.0 mm	15.9 in	403.0 mm	15.9 in
L	REACH	383.0 mm	15.1 in	400.0 mm	15.7 in	417.0 mm	16.4 in	430.0 mm	16.9 in
M	STACK	500.0 mm	19.7 in	530.0 mm	20.9 in	560.0 mm	22.0 in	600.0 mm	23.6 in
N	STEM LENGTH								

SPECIFICATIONS

PLASMA TEAM ISSUE

FRAME	Plasma 5 / IMP technology / HMX TT / TRI Geometry / Plasma HMX seatpost / Replaceable hanger / UCI approved
FORK	Plasma 5 1"- 1 1/8" Carbon / integrated
HEADSET	Syncros Integrated 1 - 1 1/8" drop-in headset
REAR DERAILLEUR	Sram Red22 Carbon Ceramic 22 Speed
FRONT DERAILLEUR	Sram Red22 Titanium Yaw technology
SHIFTERS	Sram Red22 R2C 1090 SL YAW Carbon

BRAKE LEVERS	SRAM BL990
BRAKES	**Front:** SCOTT TKB136 **Rear:** Shimano Dura Ace, direct mount
CRANKSET	Sram Red22 Exogram Carbon 39/53 T
BB-SET	Sram Int BB Press Fit
HANDLEBAR	Profile Plasma 5 Aeria, flat, 420mm
AEROBAR	Profile T5+
HANDLEBAR STEM	Profile Plasma 5 TRI, 30°, 85mm
SEATPOST	Plasma HMX with Ritchey WCS clamp adjustable head
SEAT	Syncros RP1.0 TRI

HUB (FRONT)	Zipp 404
HUB (REAR)	Zipp 808
CHAIN	Sram Red22 PC-1191
CASSETTE	Sram Red22 XG 1190 / 11 Speed 11-26 T
SPOKES	Zipp 404 / 808
RIMS	**F:** Zipp Carbon 404 Firecrest CC **R:** Zipp Carbon 808 Firecrest CC
TIRES	Continental Grand Prix 4000s II 700 × 23C
WEIGHT	8.50kg / 18.74lbs

PLASMA PREMIUM

FRAME	Plasma 5 / IMP technology / HMX TT / TRI Geometry / Plasma HMX seatpost / Replaceable hanger / UCI approved
FORK	Plasma 5 1"- 1 1/8" Carbon / integrated
HEADSET	Syncros Integrated 1 - 1 1/8" drop-in headset
REAR DERAILLEUR	Shimano Dura Ace RD-9000 22 Speed
FRONT DERAILLEUR	Shimano Dura Ace FD-9000
SHIFTERS	Shimano Dura Ace SL-BSR1 bar end

BRAKE LEVERS	Profile Design 3 / one C
BRAKES	**Front:** SCOTT TKB136 **Rear:** Shimano Dura Ace, direct mount
CRANKSET	Shimano Dura Ace FC-9000 39/53 T
BB-SET	Shimano SM-BB92-41B
HANDLEBAR	Profile Plasma 5 Aeria, flat, 420mm
AEROBAR	Profile T5+
HANDLEBAR STEM	Profile Plasma 5 TRI, 30°, 85mm
SEATPOST	Plasma HMX with Ritchey WCS clamp adjustable head
SEAT	Syncros RP1.5 TRI

HUB (FRONT)	Formula RB 51
HUB (REAR)	Formula RB 5711
CHAIN	Shimano CN-9000
CASSETTE	Shimano CS-9000 / 11 Speed 11-25 T
SPOKES	CN - Standard Black 2mm
RIMS	Syncros Race 27 Aero Profile 20 Front / 24 Rear
TIRES	Continental Grand Sport Race 700 × 23C Fold
WEIGHT	8.90kg / 19.62lbs

PLASMA 10

FRAME	Plasma 4 / IMP technology / HMF TT / TRI Geometry / Plasma HMX seatpost / Replaceable hanger / UCI approved
FORK	Plasma 4 1 1/8" Carbon / integrated
HEADSET	Syncros Integrated 45mm drop-in headset
REAR DERAILLEUR	Shimano Ultegra RD-6800 22 Speed
FRONT DERAILLEUR	Shimano Ultegra FD-6800
SHIFTERS	Shimano Dura Ace SL-BSR1 bar end

BRAKE LEVERS	Profile Design 3 / one A
BRAKES	**Front:** Shimano Ultegra direct mount **Rear:** Shimano Ultegra, direct mount
CRANKSET	Shimano Ultegra FC-6800 39/53 T
BB-SET	Shimano SM-BB72
HANDLEBAR	Profile OZERO TT
AEROBAR	Profile T2+ Cobra J4
HANDLEBAR STEM	Profile 1zeroseven 1 1/8" - 31.8mm - 7°
SEATPOST	Plasma HMX with Ritchey WCS clamp adjustable head
SEAT	Syncros RP2.0 TRI

HUB (FRONT)	Formula RB 51
HUB (REAR)	Formula RB 5711
CHAIN	Shimano CN-6800
CASSETTE	Shimano CS-6800 / 11 Speed 11-25 T
SPOKES	CN - Standard Black 2mm
RIMS	Syncros Race 27 Aero Profile 20 Front / 24 Rear
TIRES	Continental Grand Sport Race 700 × 23C Fold
WEIGHT	8.70kg / 19.18lbs

PLASMA 20

FRAME	Plasma 4 / IMP technology / HMF TT / TRI Geometry / Plasma HMX seatpost / Replaceable hanger / UCI approved
FORK	Plasma 4 1 1/8" Carbon / integrated
HEADSET	Syncros Integrated 45mm drop-in headset
REAR DERAILLEUR	Shimano 105 RD-5800 22 Speed
FRONT DERAILLEUR	Shimano 105 FD-5800
SHIFTERS	Shimano Dura Ace SL-BSR1 bar end

BRAKE LEVERS	Profile Design 3 / one A
BRAKES	**Front:** Tektro T730F **Rear:** Tektro T740R
CRANKSET	Shimano 105 34/50 T
BB-SET	Shimano SM-BB72
HANDLEBAR	Profile T2
AEROBAR	Profile T2+
HANDLEBAR STEM	Profile 1zeroseven 1 1/8" - 31.8mm - 7°
SEATPOST	Plasma HMX with Ritchey WCS clamp adjustable head
SEAT	Syncros RP2.0 TRI

HUB (FRONT)	Formula RB 51
HUB (REAR)	Formula RB 5711
CHAIN	Shimano CN-5800
CASSETTE	Shimano 105 / 11 Speed 11-28 T
SPOKES	CN - Standard Black 2mm
RIMS	Syncros Race 27 Aero Profile 20 Front / 24 Rear
TIRES	Continental Ultra Sport 700 × 23C
WEIGHT	9.00kg / 19.84lbs

Testing with Sebastian Kienle: wind tunnel test in the Drag2Zero Mercedes Benz Grand Prix Limited Wind Tunnel, Brackley, Northamptonshire, UK. Riding tests on the Red Bull Ring in Spielberg, Austria.