



COLNAGO CONCEPT

CONCEPT 2.0

The Colnago Concept is the latest product offering solidifying Colnago's place in cycling history. It has been more than thirty years since the first futuristic project, sharing the same name, made a significant leap forward in the world of bicycle design. A crown jewel, the first Colnago Concept showcased the debut of carbon fiber tubes as a material for constructing racing frames. Stabilized with resin matrix and nodes of a polymer mixed with carbon and glass fibers, Colnago utilized high-pressure polymerization in an autoclave to obtain the bike's light, stiff, and aerodynamic shape – a benchmark innovation for the entire cycling world.

A true technical gem, the new Concept is proudly Made In Italy with precision and style. Just as the original Concept years ago ushered in a new era of bicycle design and construction, Colnago is once again leading the charge of bicycle design with the new Concept, a model which is once again ahead of its time. Ernesto Colnago, whose name is synonymous with the evolution of bicycle design, remains as the ultimate creator and orchestrator of beautiful bicycles. Colnago bicycles are leaders in futuristic design and ultimate efficiency but never lose the legendary ride quality which truly makes a Colnago a work of art and truly special in the world of bicycles.



SPEED

Colnago has always been associated with speed on the bike. Among bicycle manufacturers, Colnago is undoubtedly the one most responsible for major advancements in bicycle design. Colnago is constantly challenging the status quo and the classic concept of the racing bicycle. Utilizing cutting edge technology, Colnago has adopted the wind tunnel as a working tool when it comes to studying modern racing bicycles, advancing aerodynamics of the bicycle in conjunction with aerodynamic position and optimum efficiency of the rider. There is no experiment that Colnago has not performed in order to improve the technical means of bicycle-design, while still delivering an unmatched aesthetic beauty. Colnago's history is full of beautiful bikes which have won the world's greatest races and broken world records. These winning bikes also represent some of the most important benchmarks in the evolution of the bicycle.



100KM OF PASSION

The test of the 100km time-trial has always challenged both athletes and builders to exceed their limits. Colnago has repeatedly taken up the challenge and has hit the top step of the podium in top world competitions in one of the most grueling endurance disciplines in all of Sport. First with Russian quartets soon followed by Italians, Colnago has made history. One memorable victory was achieved at the 1984 Olympic Games in Los Angeles. It was here Colnago introduced futuristic carbon bicycles designed and developed again in collaboration with Ferrari. Utilizing advanced monocoque carbon fiber design, these bikes were immediately recognized for their 24 inch front wheel, the advantages of which were many: This allowed athletes an even lower position on the front of the bike, significantly reducing friction with the air, created a shorter wheelbase to improve handling and allowed riders to be closer to each other in formation. Colnago was on top of the world with this design! Once again, the technological challenge was met with success and the road map to the future had been drawn.



THE BLACK GOLD

Subsequently, the marriage between creativity and technology lead to the creation of the Colnago C35 – a frame made to celebrate the first thirty five years of the Colnago as a company, founded in 1954. It's introduction was met with praise and admiration for its aesthetic beauty. Colnago's first monocoque carbon fiber road frame, it's performance left the cycling world speechless. Its materials and technical features were extremely innovative – a precursor for the current generation of carbon road bikes. The tubes were crossed by a special rib, flattened and sinuous, as well as extremely aerodynamic. The sleek lines immediately became the new standard by which all other carbon frames were compared. With the C35, weight and efficiency were improved greatly – a trend which Colnago continues to this day. Giuseppe Saronni, at the end of his pro career, debuted the C35 on the road, and with it he won the Giro of Reggio Calabria.



THE FLOW OF AIR

The Colnago CF1 (Colnago for Ferrari) was a special bike with a special name. Produced in only 500 pieces, it was also very light – just over seven kilograms. The weight was a record for that time and would be considered a lightweight frame even by today's standards. The CF1 frame's chosen material was also carbon fiber, which at the time was mainly seen only in the construction of Formula 1 race cars. For the first time a seat tube of generous dimensions was utilized on a bicycle frame. Acting as a fairing for the rear wheel, the seat tube deflected airflow around the rear wheel. Thus, it was with the CF1 that true Airfoil sections first made their appearance in the cycling world.

The CF1 also debuted a new and exclusive carbon crankset designed by Colnago – a forerunner to the monolithic pieces designed for time trial bikes today.



FAST

With Toni Rominger's Hour Record bicycle, Colnago created a masterpiece. The frame, made of steel, featured a unique blade design. This helped the Swiss racer fly from the Bordeaux track to reach the famous new limit of 55.261km in one hour. The tubes were teardrop shaped with infinitesimally thin wall thickness. To understand how thin, the fork blades measure just 7mm while the seatstays measure only 5mm. The seatpost, itself a masterpiece of technology, only measured 3mm thick. A great amount of work was also done on the bike's weight – with the complete bike tipping the scales at a mere 6.5kg, including front and rear full lenticular disc wheels! The Colnago commitment to excellence was once again recognized and was truly visionary.





FASTER...TOO MUCH

In the wake of the new Hour Record, the Colnago C42 was then presented with the intention of once again besting the current winning time – and was also produced in a road version for races against the clock. The frame had extremely prominent fairing sections, and pushed aerodynamic research to unknown and then unthinkable levels. Both Toni Rominger and Russian pro rider, Pavel Tonkov, were able to use the bike successfully on the road – the latter during Tonkov's Giro d'Italia victory in 1996. The C42 made a few more appearances before the UCI (International Cycling Union) declared the frame too futuristic and an unfair advantage and consequently prevented its use in professional racing. Once again, Colnago had struck a blow to the fundamentalist status quo which regulates and often hinders the world of bicycle design.





V1-R

The V1-r is the frame from Colnago designed for cyclists who want a no-compromise performance machine and are keen to recognize the bike's weight-to-performance ratio. As with the very first carbon bike Colnago ever produced, the V1-r was designed in conjunction with Ferrari engineers. This is why the readily recognized "Cavallino" logo appears proudly on every V1-r frame produced. The V1-r frame is monocoque construction and features complete tubing with aerodynamic cross-sections and full-carbon rear dropouts. It is arguably the most efficient and aerodynamic road frame ever created for real world road racing on any terrain and all wind conditions.

The V1-r is also a key product in the design and development of the Concept with many features of the new Concept coming directly from the V1-r.

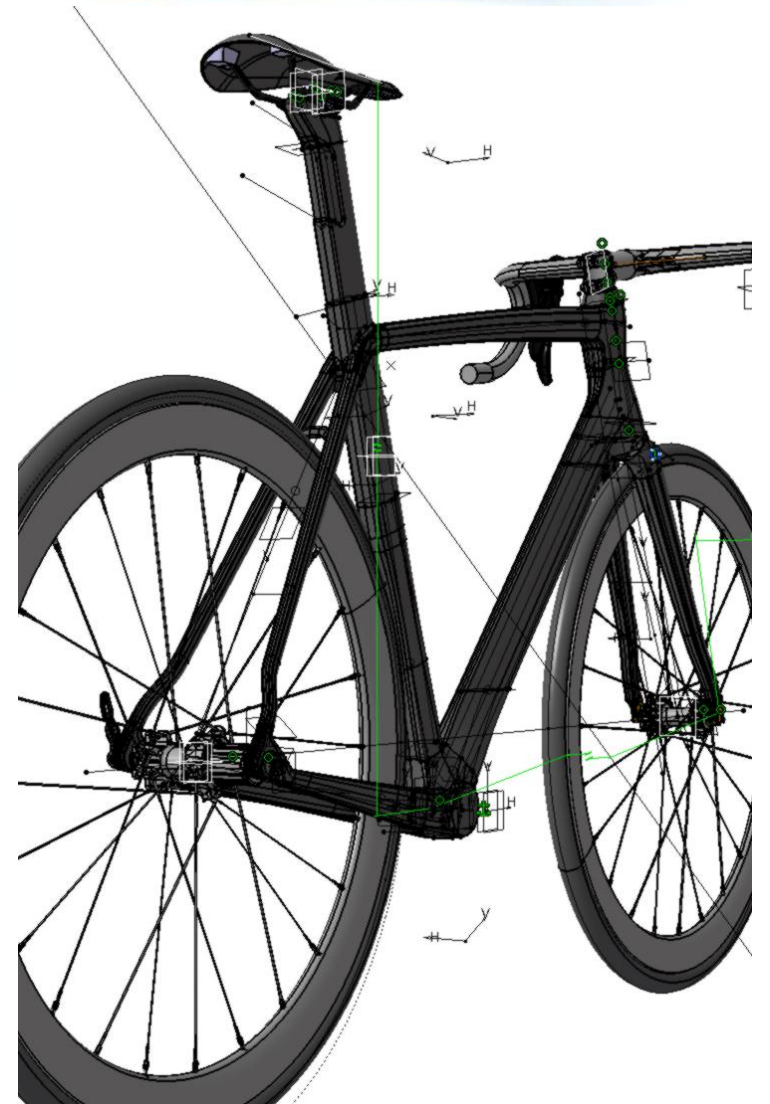


DESIGN BRIEF

Working on the V1-r project, Colnago understood it was possible to create something even faster, but were faced with both structural limitations and concerns about frame weight. Thus creating the question: Create the ultimate aero bike, the lightest possible frame or the best possible mix of the two?

In the end, with the V1-r Colnago opted for the final of the three options, creating a truly versatile aero road bike. The V1-r maximizes aerodynamic benefits and with truncated tube profiles was able to achieve optimum stiffness-to-weight ratio and conversly, an unprecedented level of performance and efficiency for a racing bicycle.

But... the question was then asked: What could be achieved in aerodynamic efficiency if willing to accept just a small penalty in added weight? (just 160grams) How much faster could it be? Then, as the V1-r was being created, a parallel project began to take life. with 41 different iterations before reaching the final shape, the Colnago Concept was then reborn!





COLNAGO CONCEPT

Focus on

 **COLNAGO**

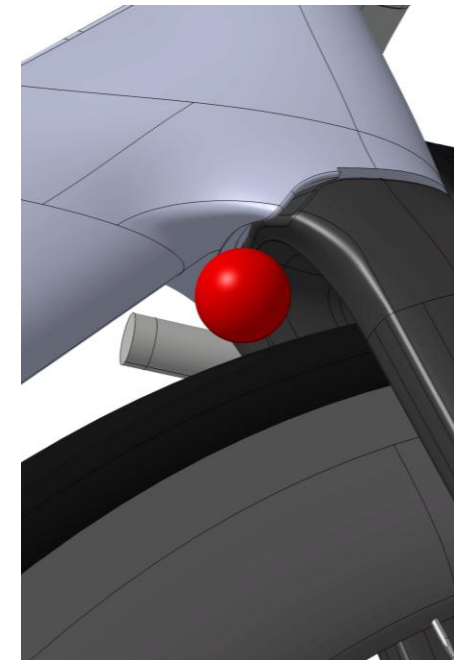


FORK

When speaking about the aerodynamic performance of a bicycle, there are three parts which deserve particular attention: the fork, headtube and handlebars. Those parts are critical to the final result of aerodynamic efficiency due to their exposure to air and the importance of how they direct this airflow.

For this reason, the Concept's fork received an extensive aero treatment. Many different options were evaluated before shaping the final version. The fork retains the characteristic V1-r leg shape but adds significant spacing around the tire (28mm tires can be used). The fork legs use a proprietary Colnago design, developed around the NACA series profile but adapt the length and width of the tube cross section to optimize the shape for speeds and wind conditions found on a bicycle in racing conditions.

The fork was designed as an integrated part of the frameset. The fork's crown fits tightly inside the frame for clean airflow around this section of the bicycle. Another important feature is a hole behind the fork crown where disrupted airflow caused by the counter-rotating front wheel and the wind can develop into a small turbulence with no negative affect on the overall aerodynamic performance of the downtube.

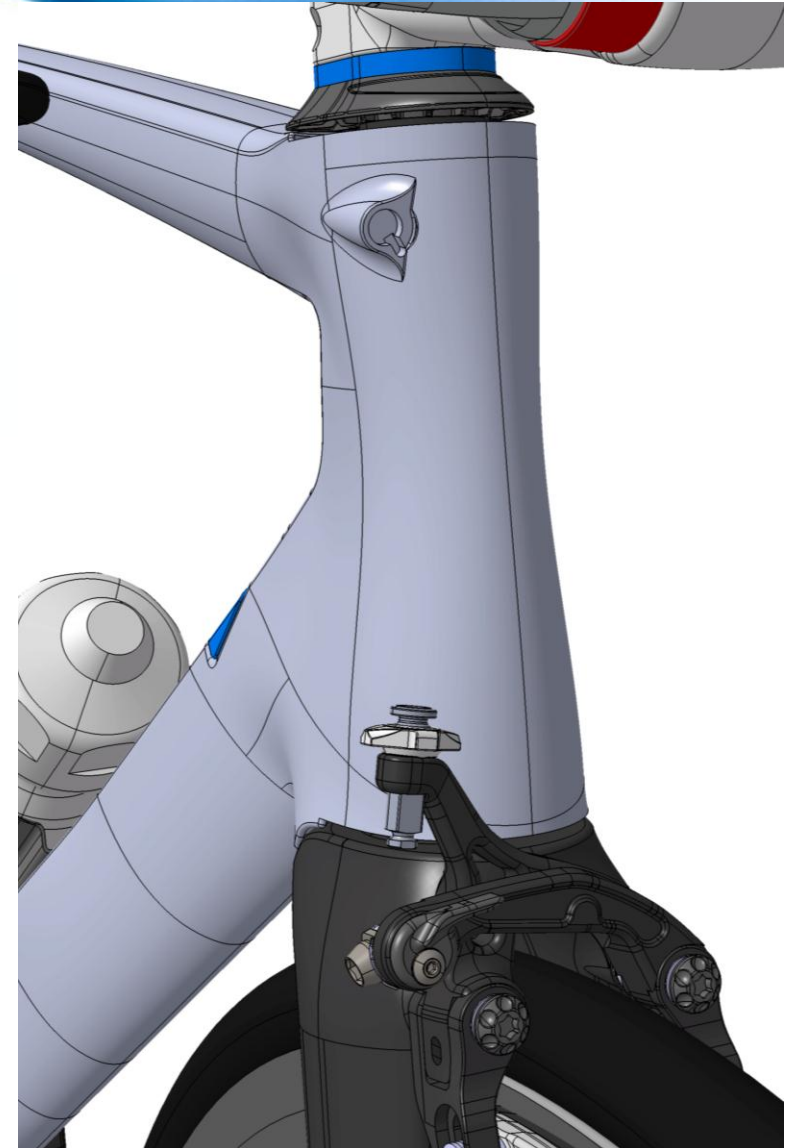


HEADTUBE

As previously mentioned, the headtube is a critical area when speaking of aerodynamics. For this reason, the headtube on the Concept has NO round part, i.e. no round leading edge. This allows the air to flow better around the headtube and significantly reduces drag. (A design originally developed for and shared with the k.zero time trial bike)

Colnago remains steadfast that aero performance is still preempted by riding and handling performance. To retain front-end lateral stiffness the Concept utilizes a 1 1/4 inch to 1 1/8 inch tapered steerer tube. This led to a massive lower section of the headtube and then to the design of a downtube nearing the maximum profile allowed by the UCI for optimal aero performance.

Finally, all of these design solutions required a special headset, also with an NACA derived shape.



HEADSET

Aero frames are usually vertically very stiff and can result in a harsh or generally poor ride quality. As Colnago wanted to make a real race bike (which is ALL Colnago is willing to make!), something needed to be done to address the increased vertical stiffness and the vibrations to the rider through handlebar on an aero profile frame.

So, Colnago increased the isolation of the fork from the frame. The Concept's fork steerer tube utilizes a special lamination process to reduce the transfer of vibration vertically along the length of the steerer tube. Additionally, the Concept adopts a special carbon-composite headset (including proprietary Colnago composite replaceable cups).

The headset's body is made of a special polymer, composed of carbon fiber and a special mix of nylon and elastomers. Combined with the Concept's sophisticated design, this feature offers the additional capacity to absorb road vibration, improving both handling and rider comfort.

The bearings are also dustproof and waterproof and the compression plug offers triple integrated protection of the steerer tube. This, combined with stainless steel bearings, offers a durable and maintenance-free ride.

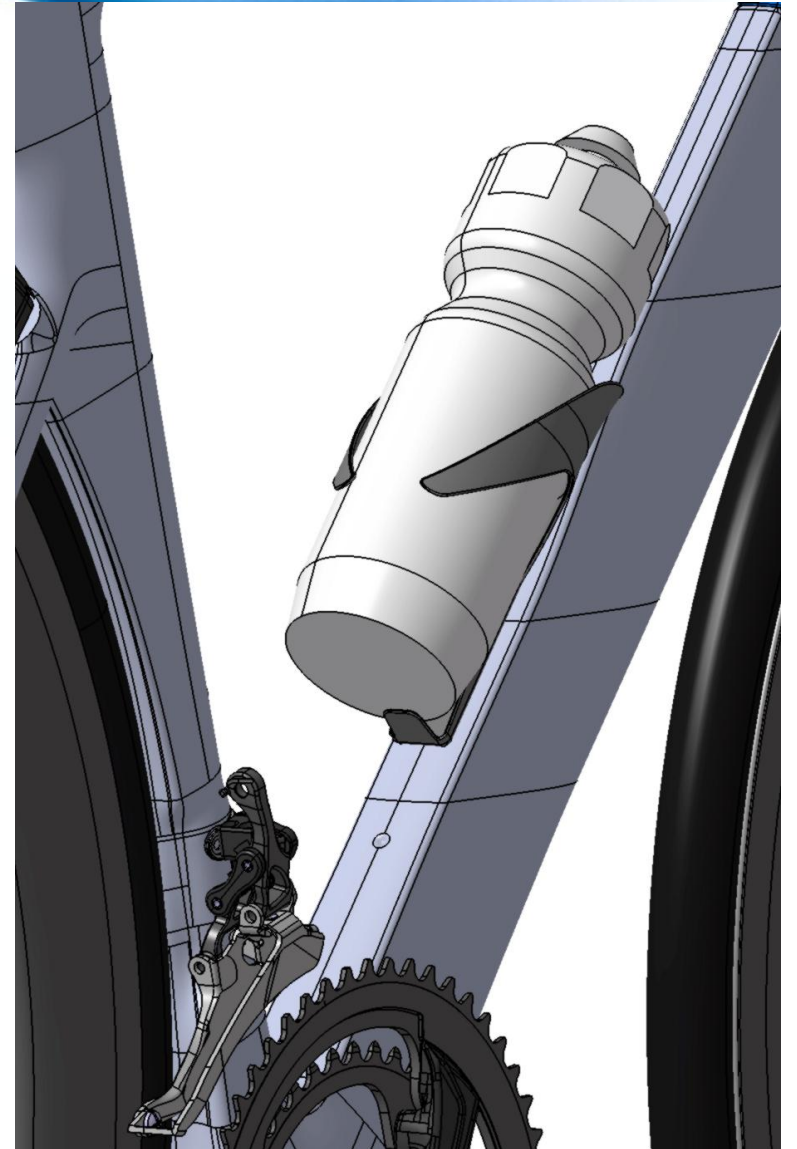


DOWNTUBE

The largest tube of the bike is clearly important for both mechanical and aerodynamic performance.

Working in the wind tunnel, Colnago discovered that continually thin-profile tubing was actually slower than a fatter profile when water bottles are installed. So the Concept features a downtube wider from the middle to the bottom to help deflect air around the bottles mounted on the frame.

The downtube on the Concept also has 3 holes for mounting the bottle cage. This allows a lower mounting position for the bottle cage if only using a single water bottle on the frame.

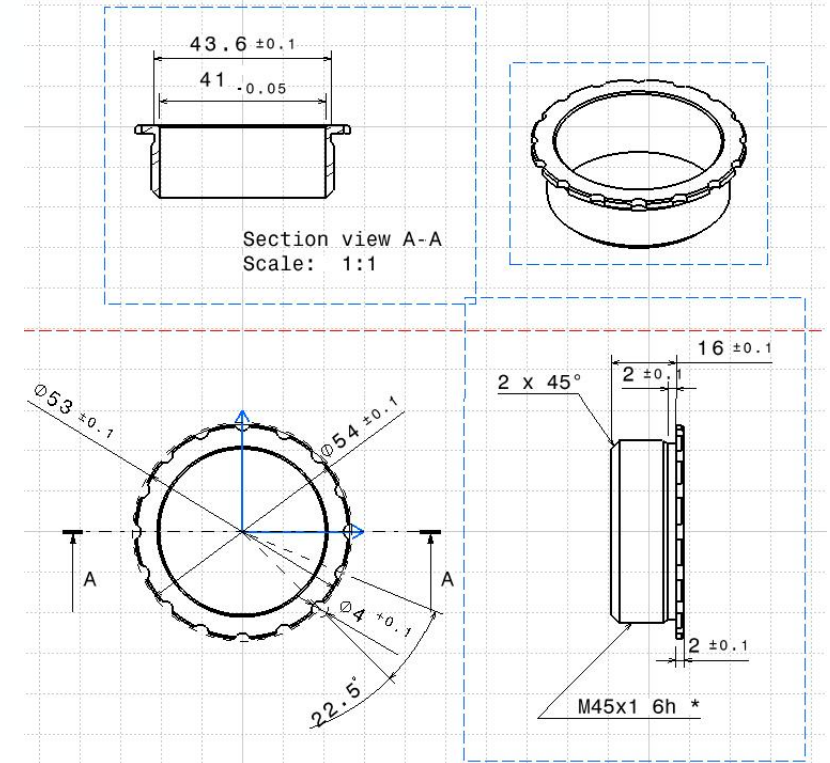


BOTTOM BRACKET

The heart of the Concept is still represented by the bottom bracket. With a strong background and great feedback from the C60, V1-r and CLX designs, Colnago continues to use our proprietary and proven ThreadFit TF82.5 bottom bracket design.

To increase the lateral stiffness of the structure without excessively increasing the wall thickness of the tubes (and conversely the weight), The Concept increases the tube cross sections. To achieve this, it was necessary to increase the width of the bottom bracket shell, thus improving lateral stiffness in the most critical area of the frame.

Colnago evaluated all bottom bracket standards currently used in the market. Colnago recognized that traditional threaded systems have obvious shortcomings regarding durability or servicability. None of the wider press-fit systems available met Colnago's requirements in terms of stiffness and reliability. Colnago decided to join the advantages of the threaded standard (reliability and easy installation / removal) with those using press-fit bearings (greater width granted to the bb shell). As a result, Colnago's patented **ThreadFit82.5** was born. It is compatible with all Pressfit 86.5 bottom brackets currently available but adds two removable cups easily replaceable in case of long-term wear.

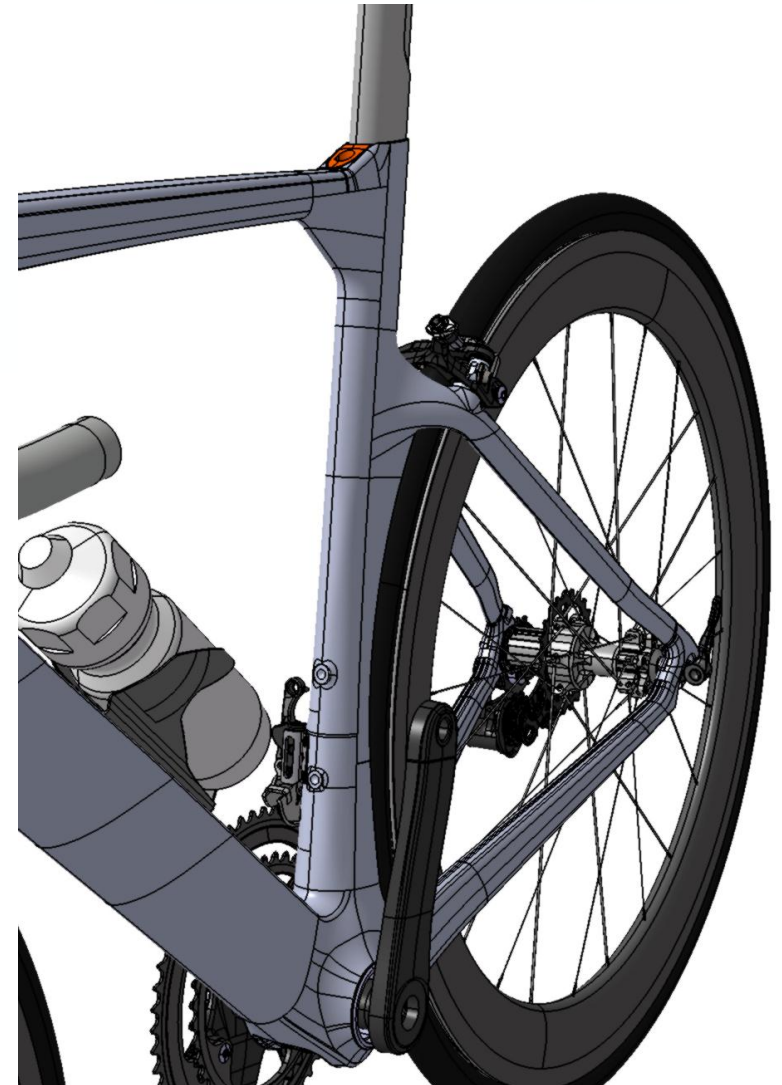


SEAT TUBE

The seat tube has a very particular shape for its specific role regarding both aerodynamic efficiency and ride or handling characteristics.

The lower part of the Concept's seat tube is tapered to reach across the wide bottom bracket shell in an area characteristic of limited airflow. Moving up the seat tube, the tube shape is designed around critical cutout for the rear wheel for efficient aerodynamics – yet not so close to limit wheel and/or tire choices (It is optimized for use with a 25c tire) The seat tube's cross section utilizes a classic foil shape and tapers to truncated profile.

Two seatpost will be available, a standard +15mm offset and a do-it-all -15/+30mm triathlon style available as an option.



AERO BENEFIT FOR EVERY SIZE

When designing a racing bicycle, UCI regulations need to be considered. The first challenge is to adapt all the rules to all frame sizes produced. While frames may seem similar, the smallest size is, in fact, vastly different from the biggest one. So for the Concept Colnago took a unique approach. The Concept is designed in each size to be 100% UCI legal but without compromising either aerodynamic efficiency or ride quality for each individual frame size offered.

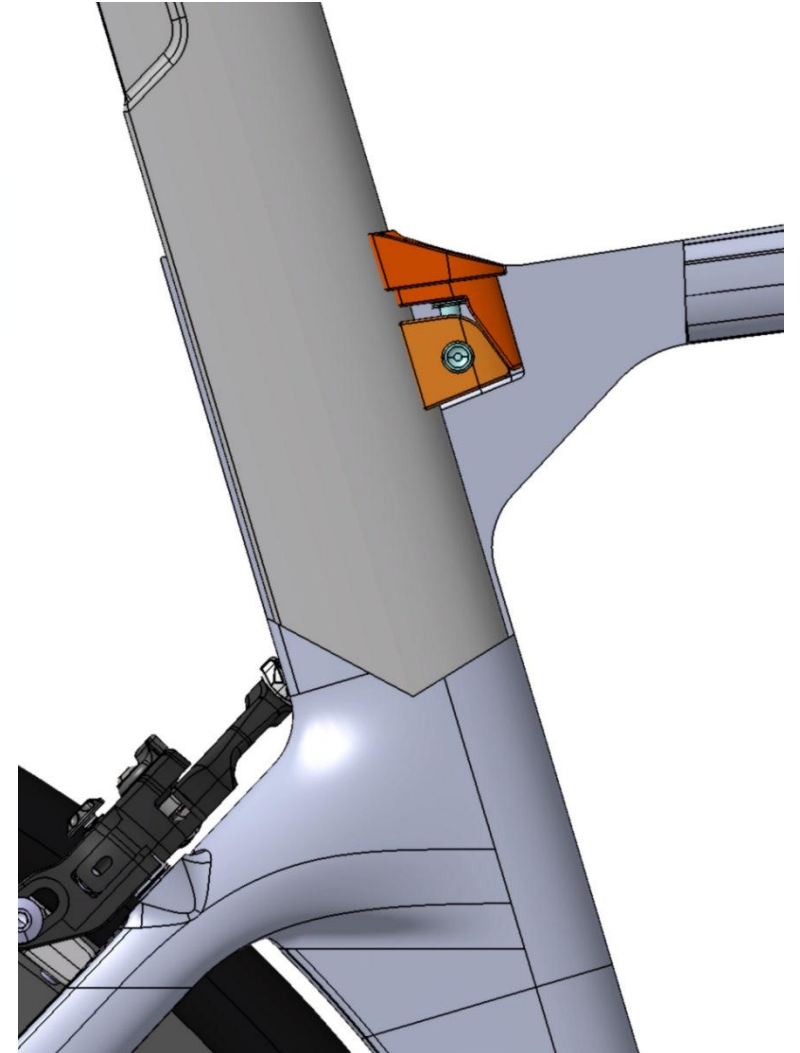
The seat stays-seat tube junction is the most evident part of this approach. While the smaller frame sizes have a closed seat tube-to-seatstay junction for an external clean airflow, the largest sizes allow the air to flow inside the seat stays, utilizing a smaller seat tube and the absence of a brake bridge to achieve this desired effect.



SEATCLAMP

For a perfectly streamlined seatpost clamp, Colnago opted for a two pieces integrated solution on the Concept.

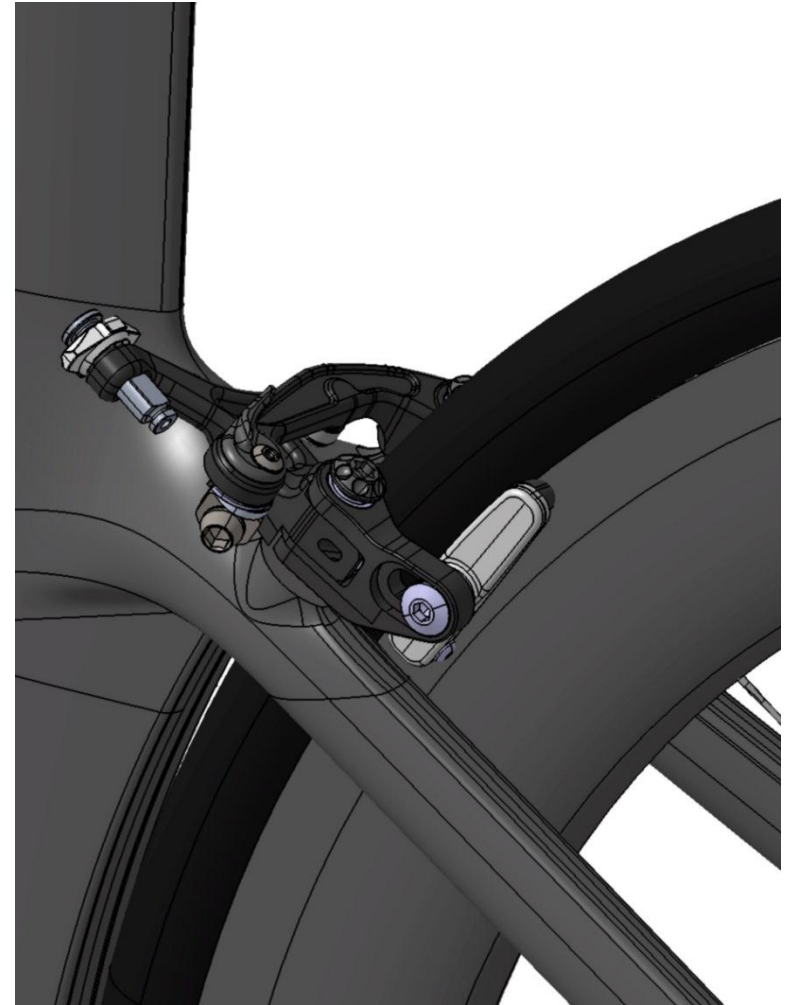
Special paint on the clamp surface itself as well as on the seattube assure maximum grip and no unwanted slippage of the seatpost, nor the necessity to overtorque the clamping mechanism.



BRAKES - 1

Being born as a parallel project to the V1-r, the obvious choice for brakes on the Concept were direct mount dual pivot brakes.

The only difference on the Concept being the position of the rear brake is moved from the chainstay to the seatstay. While there's a small aerodynamic advantage for the former, the latter, traditional position offers greater ease of maintenance and cleaning and more importantly: quicker wheel changes (and is the preferred choice based on feedback from our sponsored pro teams and mechanics).



BRAKES - 2

Of course, As are the V1-r and C60, the Concept will be available in a disc brake version as well (to be released later this season).

Like the V1-r Disc and C60 Disc, the Concept Disc will feature the Shimano flat mount standard and Colnago's new proprietary HEX12 thru-axle system.

As such, the Concept will be compatible with all the 100x12 (front) and 142x12 (rear) wheels on the market, with the advantage of Colnago's superfast quick release system.

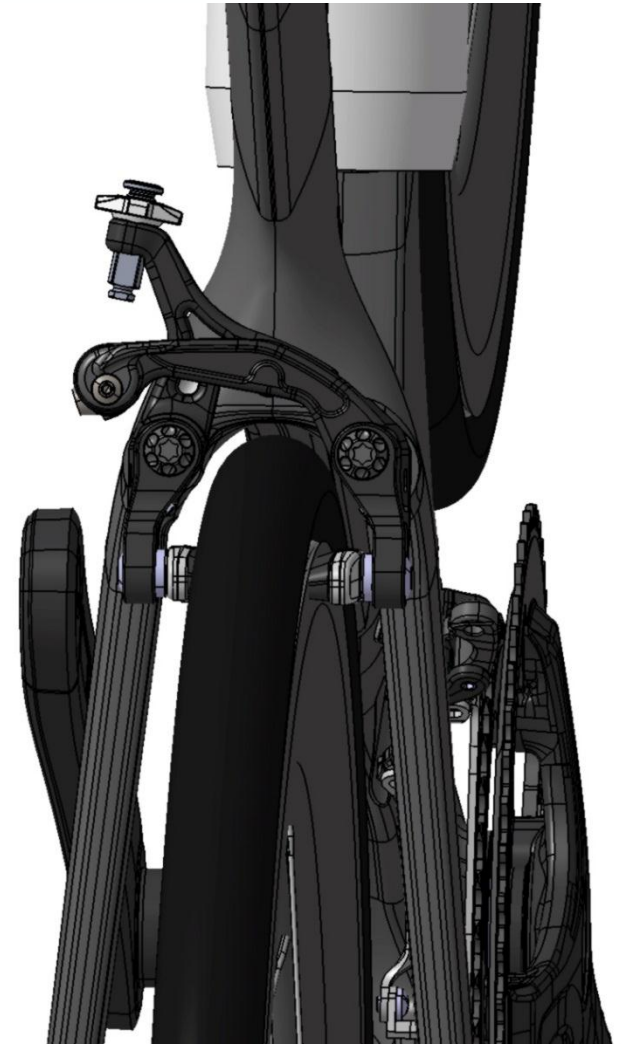


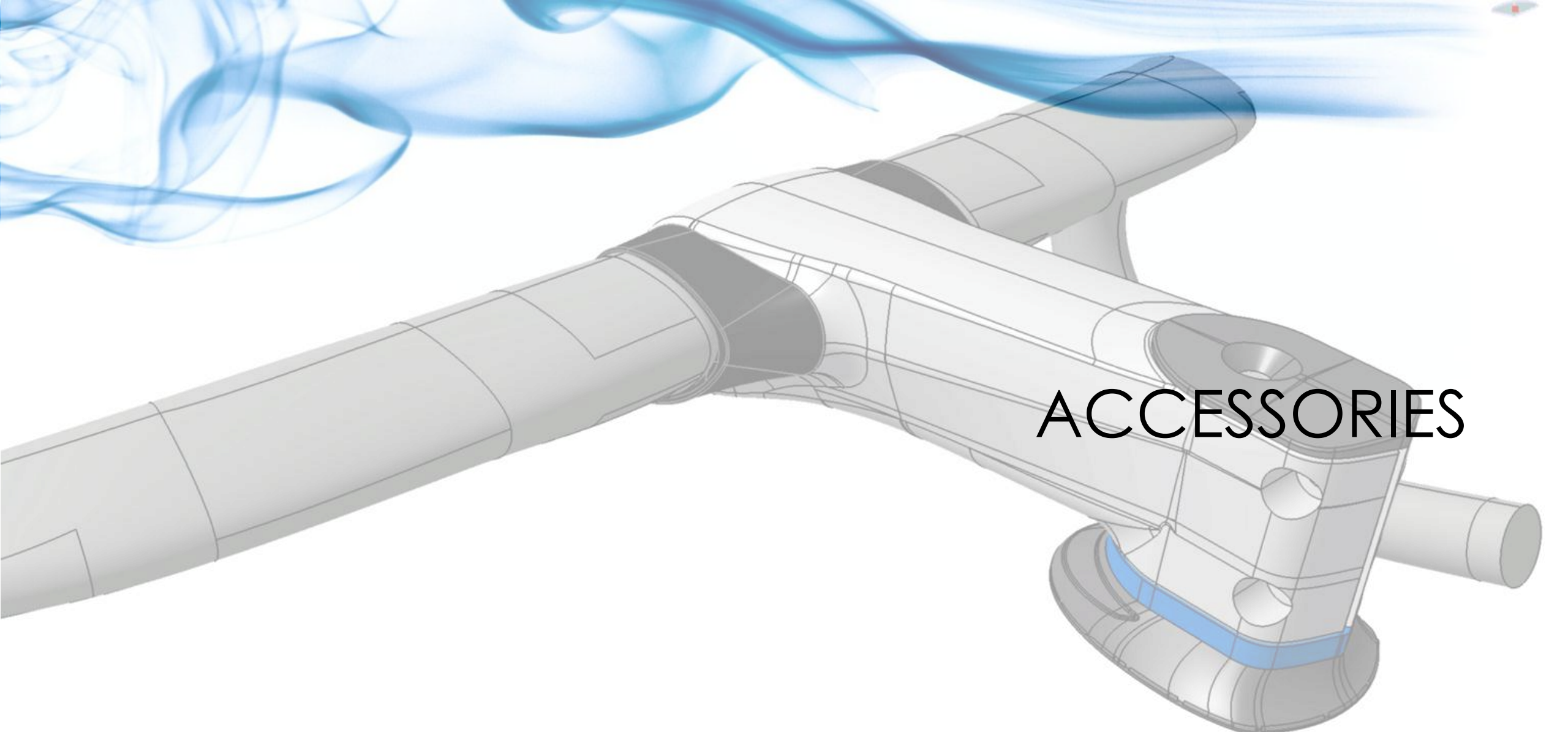
TIRE CLEARANCE

While big tires are not so common on aero bikes, Colnago believes the possibility to use 28c tires could be an added advantage for those riders who desire the versatility of a single, do-it-all bike.

Colnago designed the Concept for a (real) 28c tire (+4mm additional clearance on each axis). Colnago then went into the wind tunnel to test the Concept with larger tires. The result was surprising. The aerodynamic difference between a (rear) 25c and a 28c tire fitted in the frame is very negligible. This is thanks to the already wide seat tube which shields the rear wheel.

For a rider desiring a plush ride on an aero frame, now the Concept allows them to use 28c tires!





ACCESSORIES

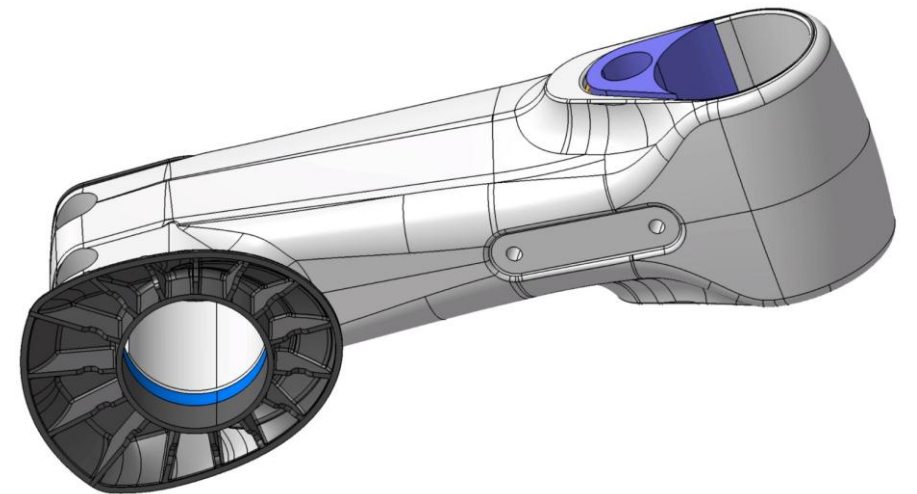
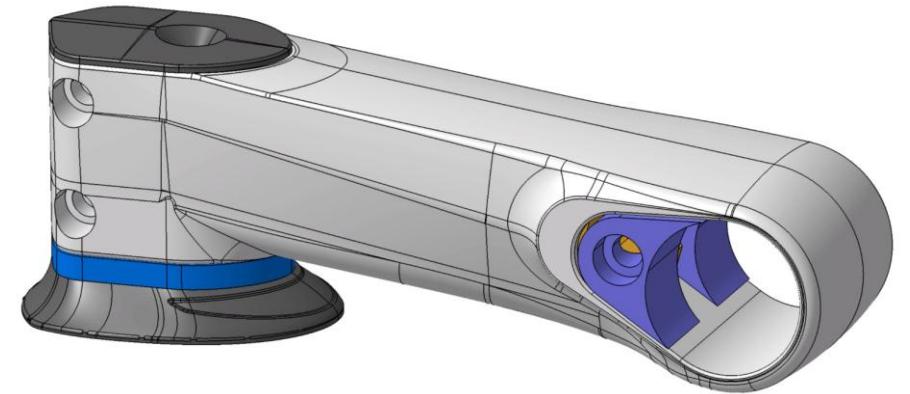
STEM

An aero frame deserves a full aero package. Integrated handlebars are usually more streamlined, thin and therefore more aerodynamic.

The cons of an integrated handlebar are the limited options (none) of setup this allows the rider. Colnago decided to skip this option and instead opted for a new; better solution. For the Concept, Colnago designed a proprietary stem, featuring no closing front bolts and with the added possibility to assemble a wide range of handlebars already on the market.

The stem is made entirely of carbon, with a proprietary construction process allowing the stem to be molded in one piece – ensuring the continuity of the fibers in the front section of the stem and thus greater rigidity and strength as compared to conventional stems. The clamping system is then composed of three pieces of aluminum using an innovative system of wedges. This allows for safe locking and homogeneous application of force, decreasing the amount of stress on the central part of the handlebar.

The Concept stem is available in five different sizes, ranging from 90mm to 130mm in length. Its shape is designed to be compatible with all standard, 31.8mm round handlebars

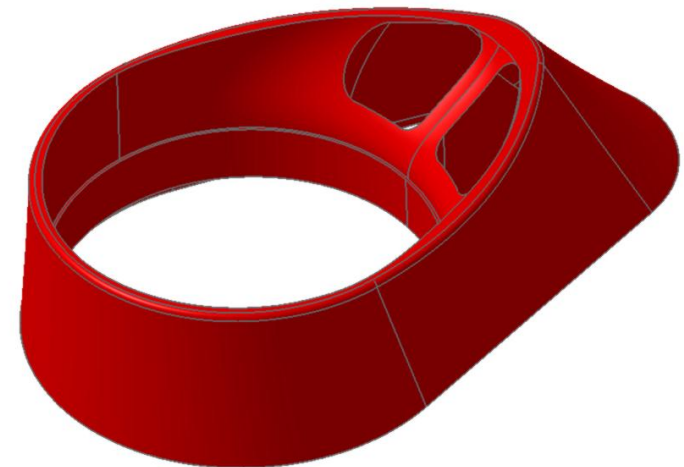
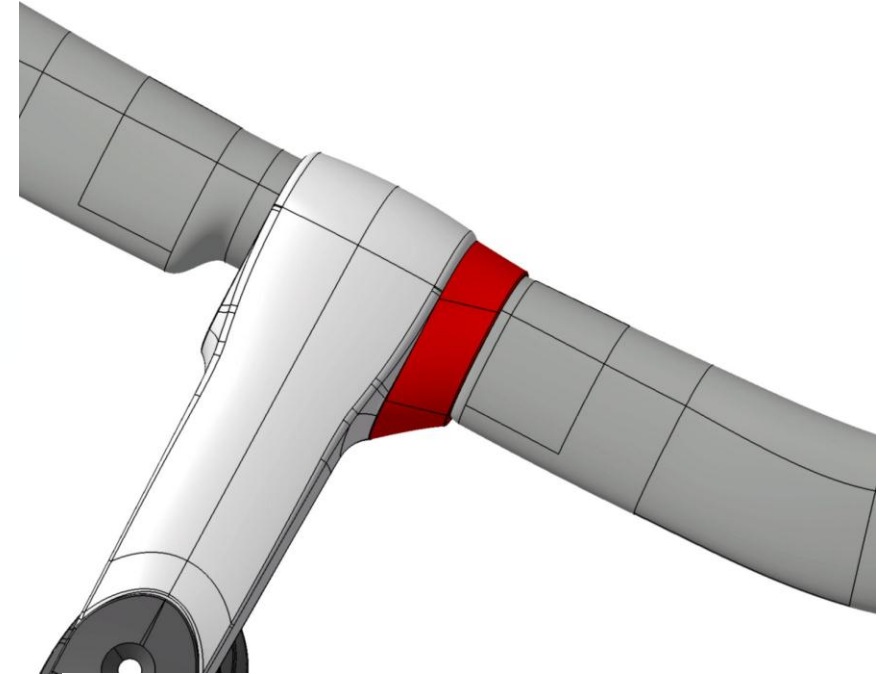




AERO COVER

The steering area is a very important point of the bike's aerodynamic performance. It is an area that truly benefits from clean airflow. To optimize the airflow around the clamping area for the Concept, connecting profiles were created between the stem and bar. This led to a considerable reduction of turbulence.

Colnago has meticulously studied the Concept stem's design in the wind tunnel. The result was superior aerodynamic performance without compromise.





NUMBERS DON'T LIE

Stiffness and aero tests

STIFFNESS

	C60	V1-r	Concept
Front end [N/mm]	82	85	78
Bottom bracket [N/mm]	65	62	59
Rear triangle [N/mm]	64	61	63
Vertical compliance [mm]	16	14	6

The Colnago Concept is not only an aero frame, it's intended to be a pure race machine. For this reason, Colnago considered all performance aspects, particularly the lateral stiffness of the frame. Compared to Colnago's two best race frames, the differences are small.

AERODYNAMIC

The development and testing process of the Concept project focused on thorough and intense aerodynamic testing. These included both both CFD (virtual simulation) and wind tunnel tests.

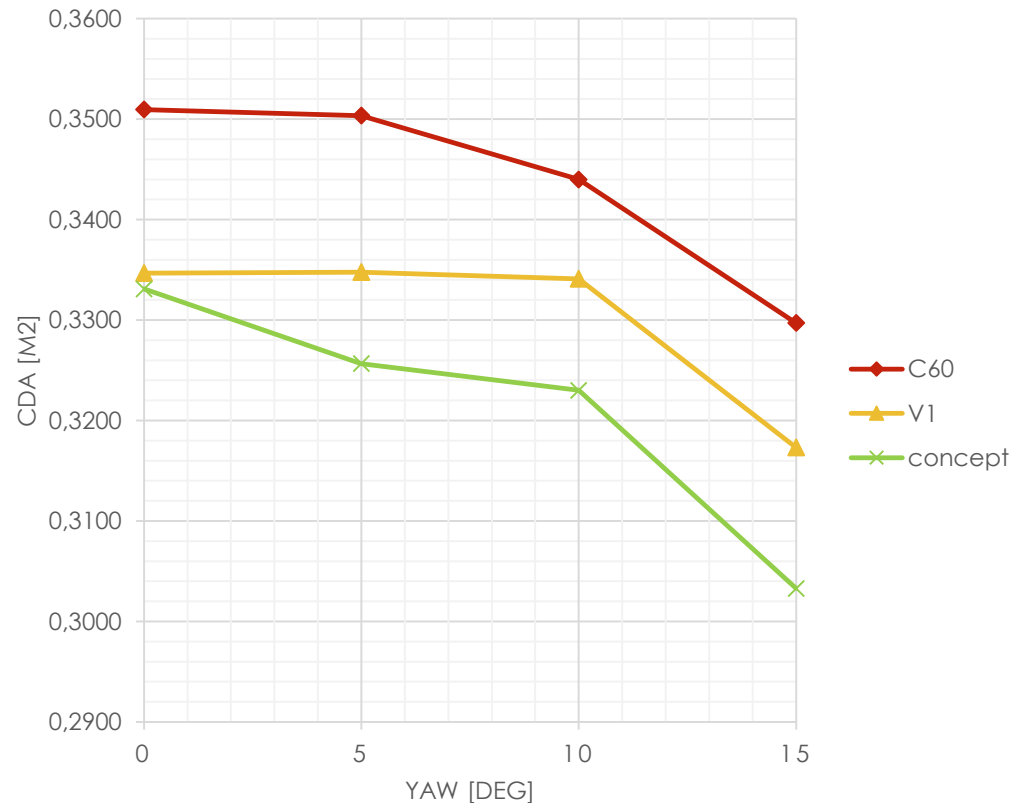
Colnago tested various configurations of tubes, comparing the Concept with the frames of our competitors. Colnago then went a step further and compiled comparisons between what are now the three best race frames: C60, V1-r and Concept.

All the frames were assembled with similar components (except the brakes, due to the different standard) and the same size frame. All the frames were tested with a single water bottle and standard stem-handlebar.

Always the same rider was used to perform the testing.

AERO RESULTS

PEDALLING TEST – DRAG AREA

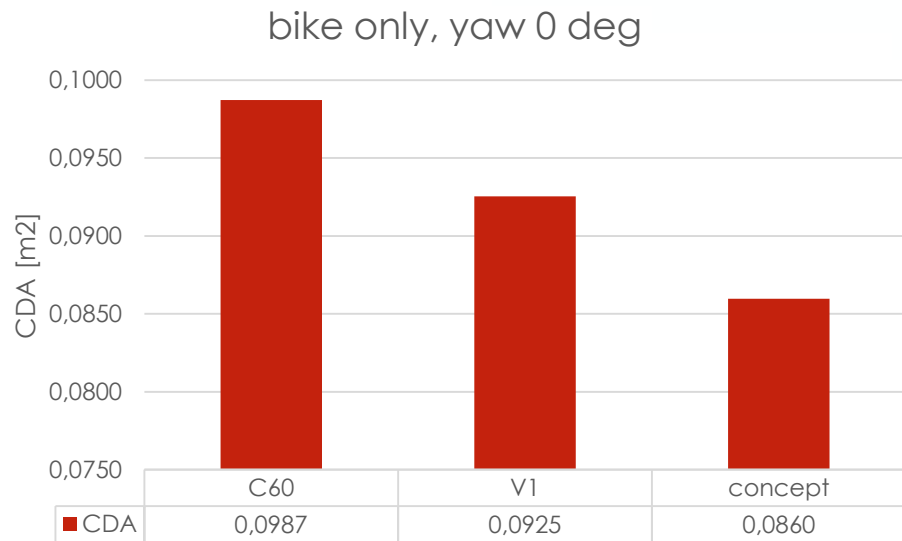


	CDA [m ²]			
	0	5	10	15
C60	0,3510	0,3504	0,3440	0,3297
V1-r	0,3347	0,3348	0,3341	0,3173
Concept	0,3331	0,3257	0,3230	0,3033

	CDA % Gain			
	0	5	10	15
C60	5,3598	7,5838	6,5006	8,7103
V1-r	0,4721	2,8009	3,4371	4,6283
Concept	-	-	-	-

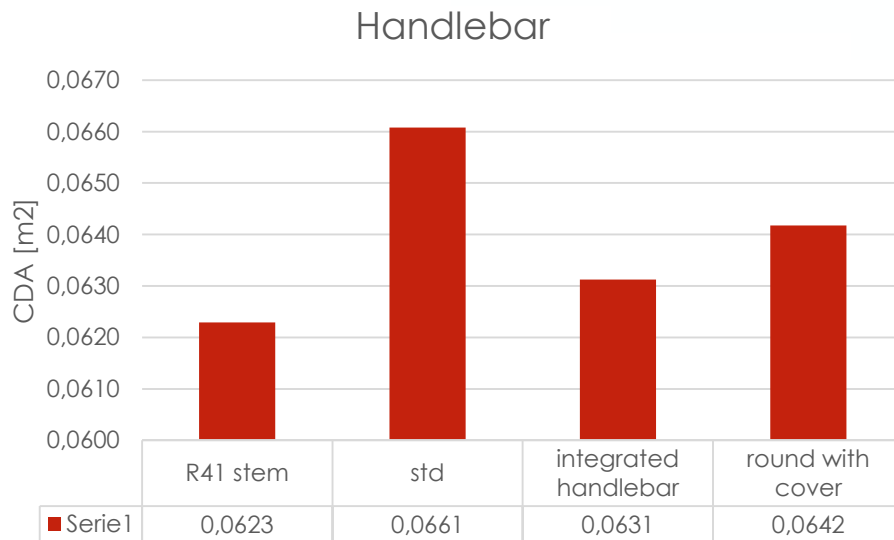
From the table above it's clear the Concept is always faster than the V1-r and C60 in all the typical yaw angle of wind. It should also be noted: the overall drag (bike+rider) decreased with increasing yaw angle, due to the circulation of turbulent air around the rider. The drag will then increase after 20° yaw angle, not reported in the graph as not a characteristic condition. With regards to power output, at 0° a medium size rider can save approximately 20watts @50kmh compared with the C60 and about 4watts @50kmh over the V1-r.

AERO RESULTS



Bikes only (no rider) were tested also. Even if this test is not so useful, due to the huge impact the body of the rider has on the overall aerodynamic of the bike, it's clear the sleek design of the Concept helps to reduce drag considerably.

AERO RESULTS



Four different stem and handlebar combinations were tested in the wind tunnel: a standard stem (4-bolt front plate) with a round (31.8mm) handlebar, a round handlebar with the R41 stem, an integrated aero handlebar and the R41 stem with aero handlebar. Final results showed a medium size rider can save around 2watts @50kmh with the Concept stem and handlebar compared to an average integrated handlebar, and approximately 6.6 watts @50kmh versus a standard stem with round 31.8mm bar.