

Campagnolo®

1995



campa



Dear Friend

During the 1994 season we celebrated the first 60 years of our company together in the best possible way: 60 years of enthusiasm, professionalism, and dedication to our mission of offering millions of enthusiasts a product always in step with the modern world's technological evolution.



With the very same spirit which has guided us over these 60 years we have designed and created the new 1995 range which will accompany you throughout the new season and which we present to you in the pages of this catalogue.

Every single component illustrated is the fruit of the imagination and experience of our designers combined with the investments made over the last few years in the fields of research and development, design innovation and manufacturing processes in the vanguard of modern technology.

The increasing emphasis that the greatest champions lay on design has led us to the creation of a range of products projected towards the year 2000, targeted at an increasing number of users. These are components designed and produced for a new generation of bikes which will make this sport even more fascinating.

We will face the 21st century together and we will continue striving to harness the fruits of our work and our will to enhance the quality of your performance.

With best sporting wishes,

Valentino Campagnolo

THE CHOICE OF CHANGE









During recent years, increased performance, innovation and reliability have been the goals towards which all Campagnolo's design efforts have been directed with the aim of achieving performances never reached before.

Giving everyone the chance to utilise the latest technology was the vision which drove us to create our new range: to allow every enthusiast to experience the same emotions with the same levels of comfort and safety with any Campagnolo group or component.

The widely-accepted ERGOPOWER controls, whose use of carbon fibre has been extended to the Chorus model, have been further lightened through an even more modern and aggressive design and are highly representative of the entire range. The new derailleurs feature important modifications that maximise sensitivity when shifting. All the ERGOPOWER control articulations, fitted with BB-SYSTEM ball bearings or self-lubricating bushes, together with the new mechanisms adopted for the front and rear derailleurs with innovative return springs, reinforce the concept of "driving the bike" - carrying out shifting and braking operations in total safety with greater precision and less effort.

This increased performance is enhanced by the EXA-DRIVE chain-rings and sprockets which are now common to all groups in the Campagnolo range. The special design and precise phasing of the engagement pins and teeth of the EXA-DRIVE chain-rings and sprockets ensures accurate and rapid shifting even under conditions of maximum chain tension, without having to reduce the pressure on the cranks.

Particular attention has been given to reaching our own demanding targets for weight reduction without compromising product safety, reliability and quality. We have, for example, designed all the new cranksets for the entire range with "low profile" cranks thus allowing the use of flush-fitting bottom brackets.

The Record Groups: today's innovations for tomorrow's cycling.



CHORUS

Born of the same experience and technology applied to the Record Group, the Chorus Group is certainly the group most in demand, owing to its versatility. This versatility, in fact, is one of the most sought-after requisites in bike components, whether they are used for professional or amateur racing, or cyclo-touring.

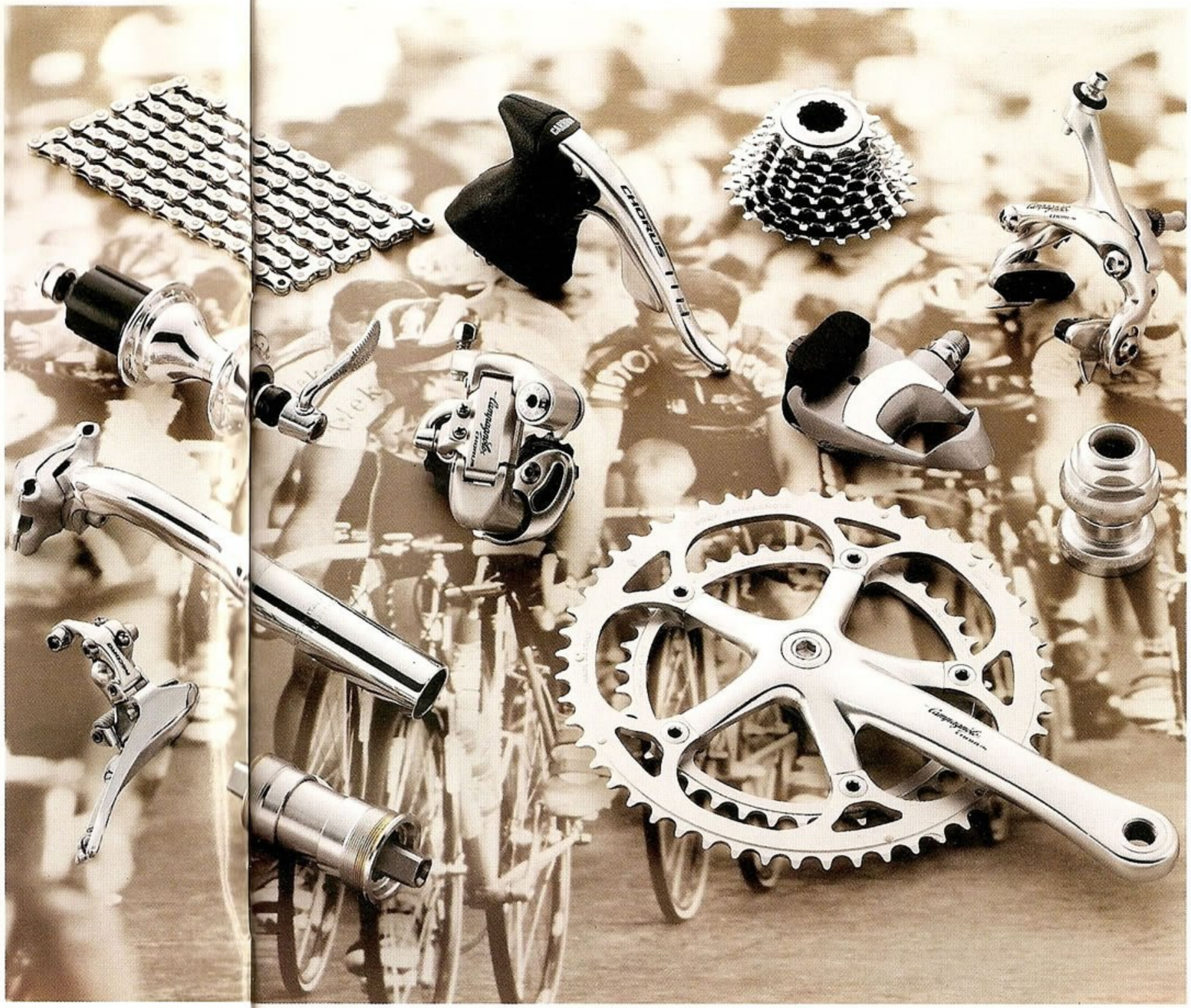
Though it is less sophisticated than the Record Group, the Chorus group shares its features of functionality and reliability in all its components, both in the transmission (Exa-Drive, ERGOPOWER, etc.) and in the braking system.

Further improvements have been made to produce a faultless, indexed transmission capable of being used in any conditions.

Great effort has been made to reduce weight through, for example, the use of carbon fibre for the ERGOPOWER controls.

Ideal for racing, the Chorus Group is also an optimum travelling companion for the cycle tourist who demands absolute perfection from his bike.

CRANKSET LOW-PROFILE · FRONT EXA-DRIVE · ERGOPOWER · 8-SPEED · REAR EXA-DRIVE





HEAD SET: The whole head set range has been completely revamped. The lighter more aerodynamic design has a 'competition' look, a feature of all Campagnolo components in this new range. All Campagnolo head sets are produced with aluminium cups with inserts added for the ball tracks. The cones are in high-strength, induction-hardened steel to avoid weakening the core of the piece which could break during assembly and use. Furthermore, all Campagnolo head sets use SELFORM, a damping system for the ball tracks of the bottom cups to reduce the possibility of 'chasing' in the tracks.



ERGOPOWER: ERGOPOWER CHORUS controls have the same functional features as Record controls. Here too, the use of carbon fibre allows weight to be reduced to levels once unimaginable with traditional materials. The various lever mechanisms are fitted with self-lubricating bushes, which ensure great shifting sensitivity and precision. Both aluminium brake levers have been further lightened. Great care has been taken with the ergonomics, using a lever hood with an enhanced design in silicon rubber. The Ergopower Chorus controls may also be used with triple front derailleurs and cranksets.



BRAKES: Utilizing the innovative double fulcrum system, Chorus brakes are made of hot-pressed aluminium alloy, the only way of guaranteeing maximum resistance to breakage. All the joints are fitted with self-lubricating bearings and bushes. Personalized setting of the brakes is possible through a combination of adjusting the return spring and balancing the brake itself with the rim. Our new brake blocks which are designed to enhance braking in wet conditions complete the Chorus brakes.

ATHENA

Athena is a valid and fine alternative to the top groups in the Campagnolo range. In the world of amateur cyclists and enthusiasts, it is already a successful name. The technical features of all the group components are the result of years of experience in the lab and on the road, experience which has confirmed the exclusive advantages of the Athena group.

The same design and manufacturing technology aimed at professionals is used in the Athena group, resulting in a high-quality product within the reach of everyone.

Apart from its high technological sophistication, particular care is taken with all details of the Athena group. The result is an attractive modern appearance, a feature common to all Campagnolo products.

The functional and quality characteristics are our traditional ones, the result of over 60 years on the road, all over the world.

CRANKSET LOW-PROFILE

FRONT EXA-DRIVE

ERGOPOWER

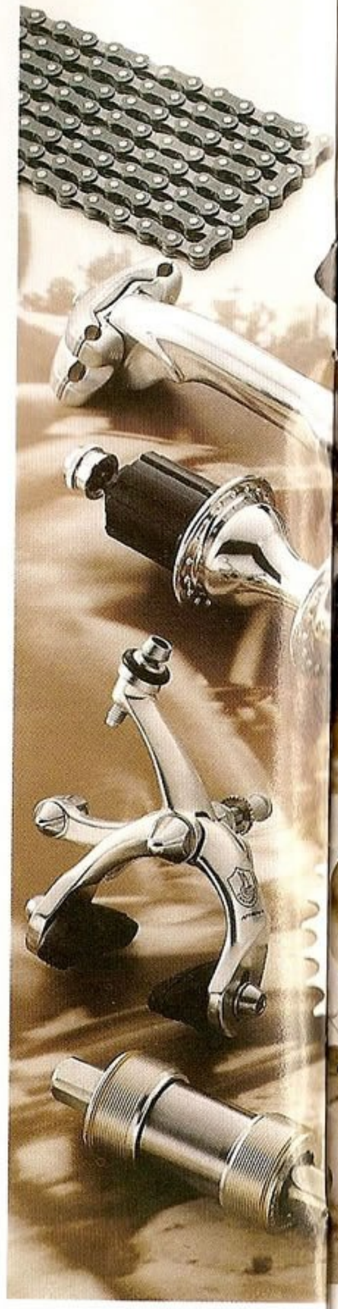
8-SPEED

REAR EXA-DRIVE

ACTION MONOPLANER



ERGOPOWER: Built with the same functional and productive concepts as the controls in higher-range groups, Ergopower Athena controls allow shifting 1, 2 or 3 sprockets at a time upwards and up to 8 sprockets downwards with a single lever movement. The left-hand lever for operating the front derailleur can also be used with triple cranksets. The two brake levers and the front and rear derailleur levers are in polished anodized aluminium. The various internal mechanisms are fitted with self-lubricating bushes. The special lever hood is in natural black rubber.







SEAT PILLAR: The Athena group includes a new all-aluminium seat pillar with an aerodynamic profile for lower air resistance. The saddle fastening brackets have two specially designed support cradles to accept all the saddle variations on the market today. With the possibility of adjusting the saddle angle in 2° steps, the cyclist can find his preferred saddle position, eliminating all discomfort.
The faces of the cradles are herringbone-knurled to prevent any chance of slippage.



CRANKSET: New 'low profile' cranksets, which are streamlined and aerodynamic, are a feature of all the Campagnolo groups. These brand-new Campagnolo cranksets have a spoke and shank geometry designed with the aid of CAD to find the ideal profiles for transferring the working loads directly to the bottom bracket axle. This new geometry reduces the dispersion of energy due to flexion of the system. The special crank design has enabled us to develop a bottom bracket with a shorter, lighter and even more rigid axle.

VELOCE

With the Veloce group, Campagnolo has committed itself for the first time to supplying the great international manufacturers of assembled bikes.

With the same desire for success shown in the high-range groups, Campagnolo has built a group of unquestionable performance, aimed at a greater number of amateurs and enthusiasts. The technical performance of this group is at the same level as those of top-range groups and shares their advanced innovations: ERGOPOWER, Exa-Drive sprockets and chainrings, 8 speeds, low-profile cranksets, and so on.

The Campagnolo R&D department has created an alternative finish to the traditional polished and anodized one: this is 'NYTECH', which, with its distinctive snappy colour appreciated by younger users, gives the Veloce group its appealing personality.

Aimed at mass-produced racing bikes, but also suitable for special custom-made ones, the group is strong, light and reliable in every situation, and has the qualities and performance typical of all Campagnolo groups.

CRANKSET LOW-PROFILE

FRONT EXA-DRIVE

ERGOPOWER

8-SPEED

REAR EXA-DRIVE

ACTION MONOPLANER



BRAKES: The new Veloce brakes, which are the caliper type and use the innovative MONOPLANER system of lever interfacing, have been designed to guarantee safety on any road. Two block support levers are inserted one inside the other and their special design means that they are strong and streamlined. This system ensures perfectly balanced braking, eliminating all vibration. The block support levers are in hot-pressed aluminium alloy. These brakes are the result of extensive research by Campagnolo to ensure safe braking in all conditions.







REAR DERAILLEUR: In order to enhance the shifting performance of Campagnolo rear derailleurs, new rollers, which are designed for use with the new chain, have been introduced to the entire range. These rollers ensure greater shifting precision, permitting perfect chain alignment with every single freewheel sprocket.
All the mechanism's components are articulated on self-lubricating bushes which ensure longer life.



FRONT DERAILLEUR: After in-depth studies of derailing under stress, we have designed a more effective and reliable front derailleur. In combination with the new EXA-DRIVE chain-rings, all possible conditions of use of the front derailleur have been simulated, enabling us to determine the optimum design of the fork. This new design allows the chain to be shifted up and down from one ring to the other without the risk of it coming off on the inside or outside of the chainrings.

MIRAGE

The Mirage group is a further step forward in Campagnolo's conquest of the pre-assembled bike market and is already highly appreciated by the leading international manufacturers.

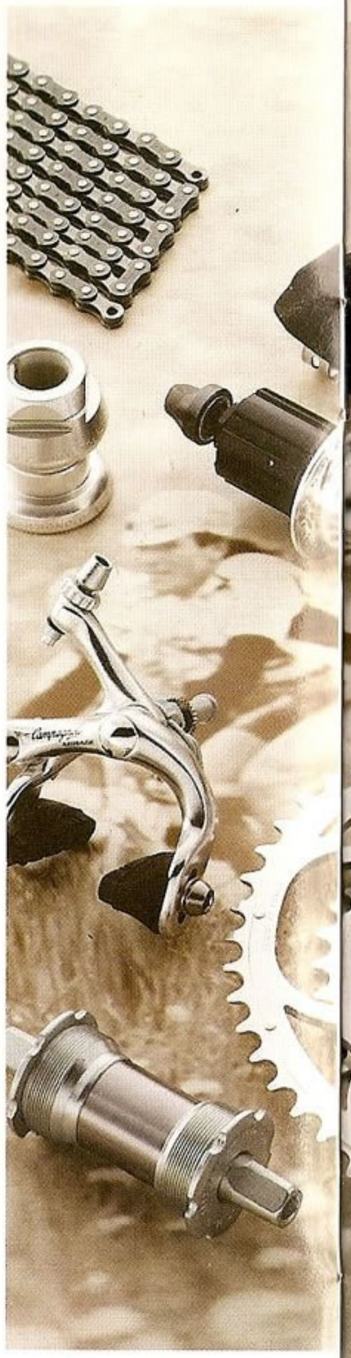
The Mirage group is aimed at all those who seek the functionality and performance found in high-range groups.

Even though it belongs in a much lower price range, the performance and features are comparable to all other groups with its 16 speeds, Exa-Drive type chain-rings and sprockets, double-lever ERGOPOWER controls, the new low-profile crankset, 8-speed cassette hub, and quick-release pedals in aluminium.

It is very important to remember that all Campagnolo groups are completely compatible with one another so as to allow dealers great flexibility when repairing or replacing a component, without being obliged to fit the piece originally envisaged for the group.

Like all the other Campagnolo groups, Mirage is destined to become another best-seller amongst enthusiasts.

CRANKSET LOW-PROFILE · FRONT EXA-DRIVE · ERGOPOWER · 8-SPEED · REAR EXA-DRIVE







SPROCKETS: The sprockets of the cassette-type free wheel are another fundamental transmission component. Indexing performance depends on tooth design, machining quality and precise spacing. For this reason, we decided to extend the EXA-DRIVE sprocket blocks - already present in the top-range groups - to the lower-range Mirage and Avanti groups.
These sprockets, in combination with the improved side-plate design of our new chain, permit shifting even when the chain is under maximum tension.



REAR DERAILLEUR: The rear derailleurs of the whole Campagnolo range use a new system with a square-section conical spring, designed to increase the smooth operation of the Ergopower controls. This occurs with no deterioration in the traditional performance of the rear derailleur with its fast, precise shifting. In effect, control of the rear derailleur is easier with an overall smoother operation.
The final touch is the name stamping of all the components of the original group to identify the various groups of the range.



BRAKES: Mirage brakes are the ultimate expression of functionality and reliability. The CAD-designed block support levers are in hot-pressed light alloy to guarantee the maximum resistance to breakage, an essential feature for a safety component such as the brake. The blocks are the result of lengthy research by Campagnolo to ensure safe braking in all conditions. All Mirage components benefit from the traditional, high-quality anodized finish of the top-of-the-range products.

AVANTI

The latest arrival in the Campagnolo family, the Avanti group, is surely destined to become next season's best-seller, and is a clear indication of our mission to offer everyone the chance to feel the benefits of modern technology. The Avanti group, aimed exclusively at racing bike manufacturers, will find fertile ground among thousands of young and not so young fans, who will further spread the love for competition or touring.

The Avanti group is in no way inferior to our top groups. It incorporates all the same innovations developed for the professional groups and is built with the same attention to detail, faithful to the criteria of functionality and reliability embodied in all Campagnolo groups: 8 speeds, ERGOPOWER controls, EXA-DRIVE sprockets and chain-rings, and quick-release pedals are just a few of the features of the Avanti group.

The Avanti group can easily be transformed into a triple chain-ring version for touring by using components specifically developed for the Mirage group, which, like all Campagnolo components, are entirely compatible.

FRONT EXA-DRIVE · ERGOPOWER · 8-SPEED · REAR EXA-DRIVE



REAR HUB: All the most innovative manufacturing processes have been used in building the Campagnolo cassette-type hub. The hot-pressed hub bodies and the cold-pressed freewheel bodies are finished on numerically-controlled machines - a process which, along with the specially dimensioned axle, guarantees the reliability required of the component. The bearings of the hub are built in the traditional Campagnolo way and feature adjustable cups and cones. The freewheel body, which can be completely disassembled, rotates on rigid bearings which are completely protected from the ingress of dirt and water.



CHAIN-RINGS: In order to maximise derailing performance, chain-rings have been developed which draw on the EXA-DRIVE system used in the top-range groups. These chain-rings are machined into a special profile. This profile, in combination with the engagement pins, ensures fast passage of the chain from one ring to the other, with no delay. The machining of the outer chain-ring is synchronised to its inner ring partner, resulting in an ensemble which provides perfect derailing in all conditions.



ERGOPOWER: The ERGOPOWER AVANTI controls emphasise Campagnolo's desire to offer the rider a totally reliable product with unparalleled performance. The AVANTI control, which draws on the lever operation system for the front and rear derailleur, has been completely modified internally to make its operation even smoother and more precise. New mechanisms have been developed, and the lever itself has been modified to make it more rigid. Comfort and appearance have not been overlooked either, with the new, ergonomic lever hoods in natural rubber

RECORD O.R.

Wherever there is competition, Campagnolo is present, at the riders' service with the design experience and philosophy acquired in over 60 years of racing. For the Record O.R. group, aimed at competitive off-road bikes, Campagnolo has utilised the same design, construction and functional concepts used for the road groups, adapted to the specific requirements of off-road cycling.

The same desire to innovate has led to the development of components with features which highlight Campagnolo's determination to make exclusive products available to cycling enthusiasts whatever kind of terrain they ride on.

Like all Campagnolo groups, the Record O.R. group has an 8-speed indexed transmission with Exa-Drive sprockets and chain-rings. The transmission is the Compact Drive type with a unique system of mounting the inner chain-rings in cassette fashion, similar to the one used for the freewheel sprockets.

Aimed at all purpose-built off-road bikes, the Record O.R. group will help you fully enjoy your off-road trips in the woods, on dirt roads or on mountain tracks.

FRONT EXA-DRIVE · CRANKSET LOW-PROFILE · 8-SPEED · REAR EXA-DRIVE







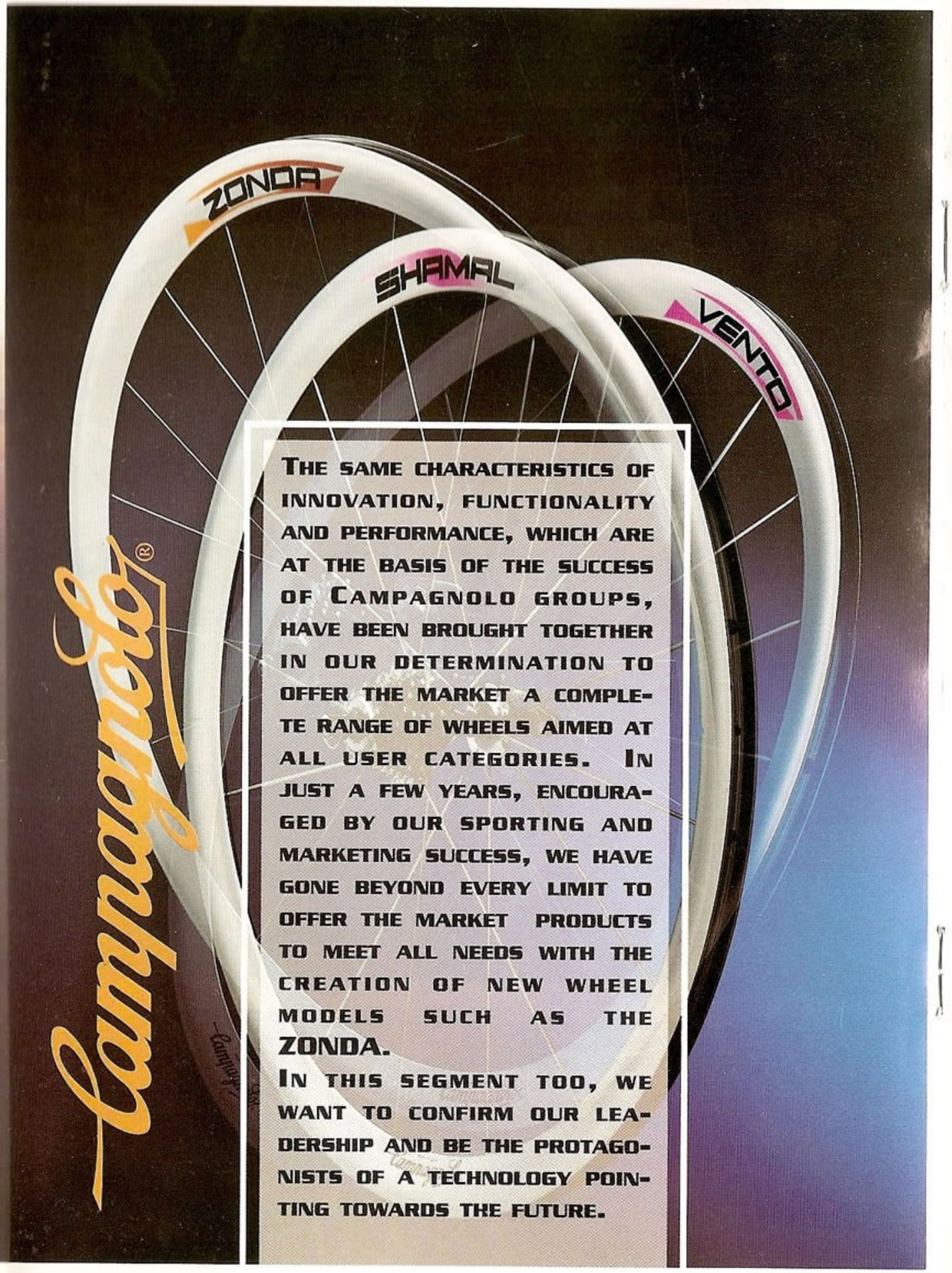
CRANKSET: Optimization of the transmission and weight reduction are the goals behind this innovative crankset with cassette-type chain-rings. The chain-rings, assembled directly on the crank with the same system used for freewheel sprockets, are lighter and stiffer. The same tooth profile developed for road chain-rings has also been adopted for the Record O.R. crankset. The reduction of the number of chain-ring teeth also enhances the performance of other components such as the front and rear derailleurs, guaranteeing greater functionality of the entire transmission.



BRAKES: Record O.R. brakes are in aluminium alloy and are equipped with a new system for fixing and adjusting the blocks on the block support lever. The articulation on a spherical sleeve permits orbital adjustment in any direction. This guarantees perfect alignment of the block to the rim profile, thus ensuring effective braking at all times. The blocks are made of a special compound and are specifically designed to meet the severe demands of off-road riding in extreme conditions.

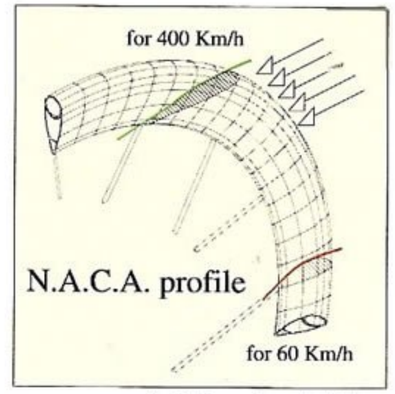


THUMBSHIFTER CONTROLS: These are the world's lightest front and rear derailleur controls for off-road bikes. Perfectly designed with the best ergonomics possible, they are adjustable in all directions, allowing the rider to select his own steering position. The levers are articulated on ball bearings and ensure a fluid, smooth shifting movement, with the minimum effort from the rider.



THE CHOICE OF FLYING

Initially born as Campagnolo's technological response to spoked wheels for time-trial bikes, the Shamal wheel can be considered the forefather of a new generation of wheels aimed at all categories of users. Due to the innovative design of all its components, it immediately met with great success, not just in races against-the-clock. During the design of these wheels, precise objectives were set to achieve the best possible technological compromise: a mix of **Aerodynamics**, **Lightness** and **Rigidity**. These three goals emerged from a series of specific questions: What is the importance of aerodynamic resistance? How much energy and thrust is lost if the wheel is laterally flexible? What is the effect of wheel weight on performance?

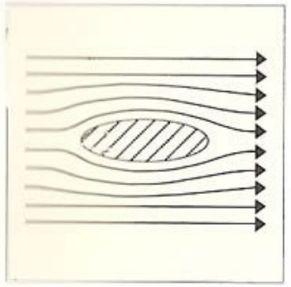


Applied aerodynamic study

AERODYNAMICS: Aerodynamics, which improve air penetration, optimise steering and reduce energy expenditure, are extremely important in helping a rider gain time. It is essential, therefore, for the wheel to have the highest penetration both with regard to the rim profile and the shape and number of spokes; when the wheel rotates it must not create vortices in the air.

The profile designed into all Campagnolo spoked wheels is the result of applying to bike wheels the curve research findings of the N.A.C.A. (National Advisory Committee for Aeronautics), which were originally employed in aeronautic design. During the research phase for the best rim aerodynamics, the combination of the rim and tyre was always taken into consideration. The resulting design, different for each wheel model depending on the number of spokes and the material used, increases air penetration and eliminates the formation of air vortices, which lower bike speed. Particular attention was also given to the design of the single spokes since they play a major role in the formation of vortices, which are numerous and in continuous movement, affecting the entire surface of the wheel itself. The profile of the rim and the greater spoke tension made it possible to reduce the number of spokes to 16. The spokes, too, are the result of the application of N.A.C.A. curve research and have an exclusive design with a progressive elliptical section to eliminate all turbulence during wheel rotation.

A further step towards the reduction of air resistance was achieved through recessing the spoke nipples into the rim itself. These 'hidden' nipples can be accessed easily using a simple socket wrench.

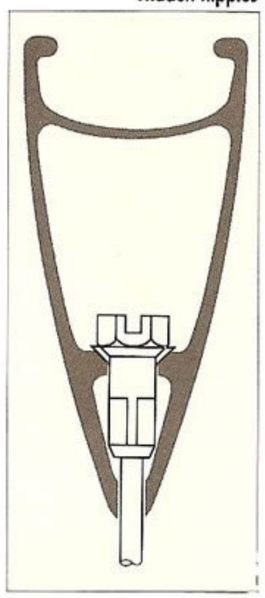


Exclusive spoke section

LIGHTNESS: A particular effort was made to achieve the lightest wheel possible.

The wheels must be as light as possible in order to minimise the force and energy required of the rider and to give the bike greater acceleration and momentum. With their special rim profile and reduced number of spokes, Campagnolo wheels are lighter than traditional ones. This lightness, accentuated by the use of composite materials such as carbon fibre in the Bora rim, allows the innovative features of Campagnolo spoked wheels to be exploited on any terrain, even when climbing.

Hidden nipples



RIGIDITY: When designing Campagnolo wheels, enormous importance was given to the rigidity of both the rim and the rim/spoke/hub combination. Rigidity must be constant at every point on the circumference and the rim must remain in the same plane when the wheel is under stress from lateral flexion (twice for every rotation of the crank plus lateral thrust to the right or left when cornering or climbing).

Campagnolo spoked wheels are capable of withstanding higher lateral forces better than any traditionally spoked wheel.

This great rigidity, obtained through the rim profile and high spoke tension (which is almost double that of traditional spokes), ensures all the rider's force on the pedals is passed to the bike's transmission, resulting in higher average speeds and faster cornering as it maintains the rider's trajectory and reduces energy wastage.

Depending on the model, Campagnolo spoked wheels are available in 26" or 28" versions, for tubular or clincher tyres, with a cassette-type 8-speed freewheel rear hub.

SHAMAL

The Shamal wheel can be considered the forebear of the new generation of Campagnolo spoked wheels which are now revolutionizing the world of bicycle wheels in general.

The Shamal wheel was the first wheel to which the principles derived from research on N.A.C.A. curves for perfect air penetration were applied.

The Shamal wheel has been chosen and used with great success in top competitions not only in specific races against the clock but on all types of terrain by world-class cyclists such as Miguel Indurain and Evgeni Berzin.

Shamal wheels are available in road and track versions, for tubular and clincher tyres, in 26" and 28" sizes, and are all fitted with a cassette-type rear hub with a steel 8-speed freewheel body.



VENTO

The increasing demand for Shamal-type wheels from the 'complete wheel' segment of the market, as well as their more widespread use on traditional racing bikes, encouraged Campagnolo to exploit the same technology to the benefit of a greater number of riders.

Featuring all the technological and design innovations proven on the Shamal, the Vento wheel is suitable for any use, and embodies the same quality, reliability and functionality of all Campagnolo products.

Vento wheels are for all enthusiasts, amateur racers and touring cyclists who demand the maximum from their bikes. The Vento wheel is available in a 28" version for clincher tyres and with a cassette-type 8-speed freewheel body.



ZONDA

The Zonda wheel is a perfect symbol of Campagnolo's design philosophy for the 1995 range. It offers less experienced cyclists the chance to utilise the same technology developed and applied to the top-of-the-range models, with the same emotions and the same performance typical of all Campagnolo products.

The Zonda project has followed the same design concepts used for the development of our top-range wheels: the profile designed according to the principles of the N.A.C.A. curve research, 'hidden' nipples, and so on.

One of the great features of the Zonda wheel is that it is also built with the aim of offering large international manufacturers the possibility of fitting low-cost bikes with hi-tech products suitable for all needs, from racing to touring, and within everyone's reach.



BORA

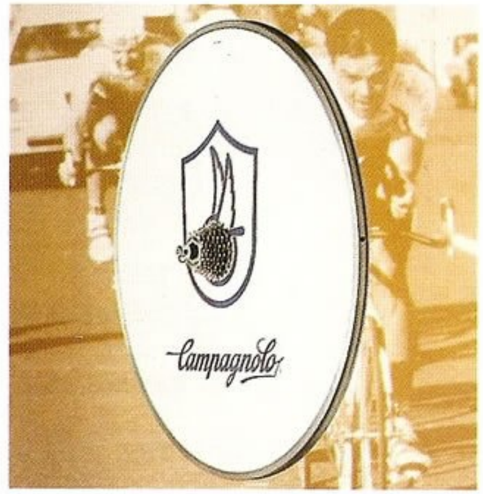
The Bora wheel was designed and built for riders for whom wheel lightness is of prime importance. The project, derived from that of the Shamal, arose from the desire to enhance the lightness of spoked wheels. To reach this goal, we exploited the most sophisticated manufacturing technologies and the use of materials such as carbon fibre. All this enabled us to reduce weight to levels never reached before in this specific segment.

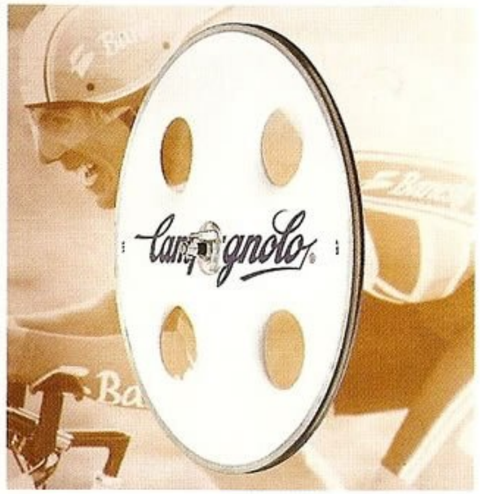
We have succeeded in slicing about 200 grammes off the weight compared with a traditional 32-spoke wheel, without, however, compromising rigidity. The special layering of the carbon fibre fabric meant that the nipples could be 'hidden' inside the rim while maintaining resistance to the high stresses to which the rim is subjected. This confers on the Bora wheel a lateral rigidity indispensable for transmitting all the rider's power.



GHIBLI

The Ghibli wheel was built using a patented system for working a super-light material: Kevlar. The use of this material, which has very high technical features, made it possible to build a wheel with practically the same weight as that of a wheel with traditional spokes. The rear Ghibli road wheel is fitted with a cassette hub with a steel 7-speed freewheel body.



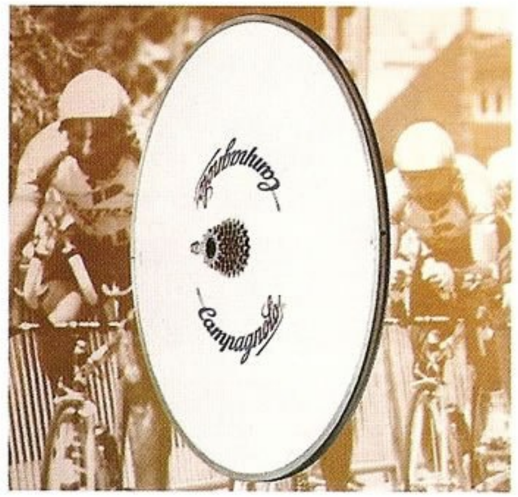


SCIROCCO

Scirocco is a front wheel specifically designed for use in side winds without compromising bike steering. This was achieved through a design with four holes in the side walls of the wheel. Following tests and experimental studies, Campagnolo's designers came with a biconical wing-shaped profile leading from the rim to the holes, in harmony with the laws of aerodynamics.

KHAMSIN

Derived from the Ghibli wheels, Khamsin wheels also offer optimal air penetration via a specially-designed, slightly convex wall profile, again respecting the laws of aerodynamics. Lightness is assured by the use of new composite materials. The Khamsin wheel has a special hub which can be converted from road to track, and vice-versa, by simply replacing the axle.



OUR LONG EXPERIENCE IN THE WORLD OF ALUMINIUM ALLOYS ENCOURAGED US SOME YEARS AGO TO DIVERSIFY INTO THE DESIGN AND PRODUCTION OF BICYCLE RIMS, TOO.

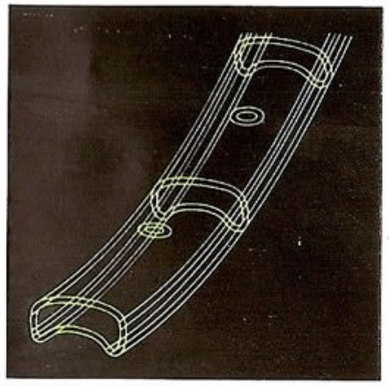
USING THE SAME PHILOSOPHY REGARDING INNOVATION, TECHNOLOGY AND RELIABILITY, ESSENTIAL AND TRADITIONAL FEATURES OF ALL CAMPAGNOLO COMPONENTS, WE HAVE SUCCEEDED IN OFFERING A COMPLETE RANGE OF RIMS FOR TUBULAR AND CLINCHER TYRES FOR RACING BIKES, MOUNTAIN BIKES AND HYBRIDS.

IN THIS SECTOR TOO WE WANTED TO OFFER A RANGE WHICH WOULD GIVE EVERYBODY ACCESS TO THE TECHNOLOGY AND HIGH QUALITY WHICH ARE THE FIRST FRUITS OF OUR INVESTMENT FOR THE FUTURE.

CAMPAGNOLO RIMS PROVIDE A COMPLETE RESPONSE TO THE NEEDS OF CHAMPIONS, BUT ALSO TO THE NEEDS OF THE REST OF US, WHO WANT TO LIVE SERENELY WITH OUR ENTHUSIASM FOR BIKES.

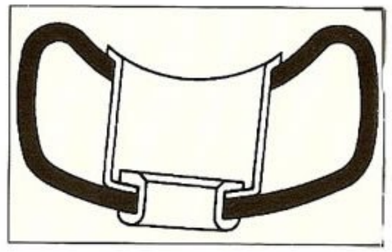
THE CHOICE OF QUALITY

The definition of a rim during the design stage is determined not only by its intended final use but above all by the levels of resistance to vertical forces and transverse and torsional stresses which it has to sustain. Campagnolo placed particular importance on the rim's resistance to vertical forces, since the life of the rim depends to a large extent on this parameter. Ride comfort is also greatly affected by this factor. During in-depth studies, the optimal level of rigidity of the various rims was determined according to their intended use, thus guaranteeing the reliability of the rim even under impact and over rough terrain. Campagnolo has developed profiles and materials for the whole rim range which solve both problems, resistance to vertical forces and comfort for the rider, at the same time.

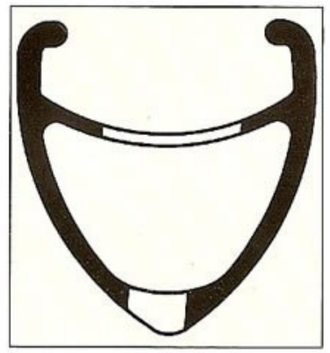


Study of the sections

As well as supporting the rider's weight, the rim is subjected to transverse stresses and torsion deriving from the thrust exerted on the pedals. The capacity to absorb these stresses is fundamental to the reliability and efficiency of the rim. This feature directly influences the continued 'trueness' of the rim: now, long hours of work by mechanics are no longer necessary to true the wheels again after a race over rough ground. The high elastic limit of the materials used assures extremely reliable truing during assembly and continued 'trueness' on the road.



Section of rims for tubular tyres



Section of aerodynamic rims

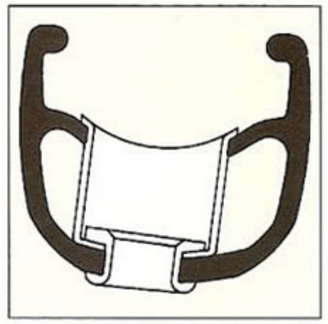
As a further aid to reliability, Campagnolo rims incorporate innovative and patented double eyelets which make assembly, truing and wheel balancing easier. Campagnolo eyelets accept the nipples in a double-position seat, depending on their working position: camber orientation with an angle of 5 degrees and crossing of the spokes with an angle of 5 degrees.

The eyelets used, adopted after a series of computer-simulated traction tests, are the double type which distribute the load



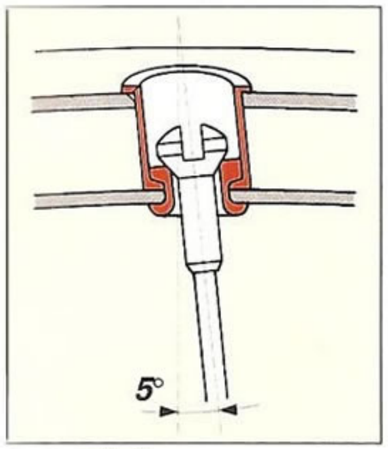


on the spoke through to the top wall of the rim. The eyelets are protected from corrosion through a surface galvanization treatment. A system of eyelets designed in this way reduces the stresses on the critical zones of the spokes and on the engagement points on the rim. This leads to a significant reduction in spoke breakages and, above all, to great speed and security in building and truing the wheel, whatever system is used.



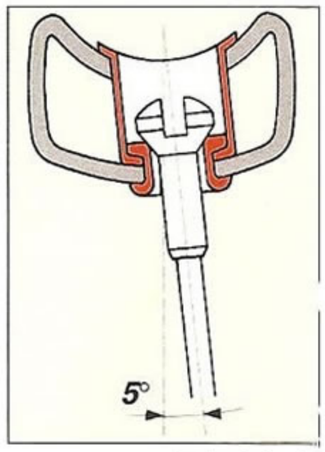
Section of rims for clincher tyres

The design of the rim section is the most delicate and complex part of the entire project. For this reason, Campagnolo's R&D department utilises CAD software on powerful modern computers, which permit rapid evaluation of how effective the proposed design will be in meeting the objectives for the rim. The rim section determines its lateral rigidity, vertical elasticity and weight.



Crossing Inclination

For every type of rim, which must meet precise standards depending on its intended use, a section is specified in order to obtain the maximum lightness possible, the maximum transverse rigidity and the ideal vertical elasticity. The section is then calibrated for every rim, to determine the optimum distribution of the materials and the mechanical effects of the geometries. With rim sections for narrow tyres, apart from the problems of mechanical performance similar to those of rims for tubular tyres, there is also the problem of the fit and seating of the tyre and tube. Critical dimensions must be achieved for accurate seating of the heel of the tyre, to avoid play which leads to 'pinching' of the tube. An important feature which is specific to competitive mountain biking is the ability to remove and refit the tyre after a puncture, without tools, using just the hands.



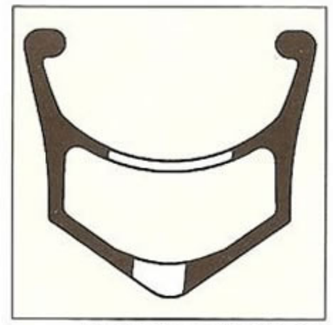
Camber Inclination

A critical aspect is braking performance, particularly on mountain bikes. It has emerged, in fact, that cantilever brakes on rims with traditional sides overheat the rim and the blocks.



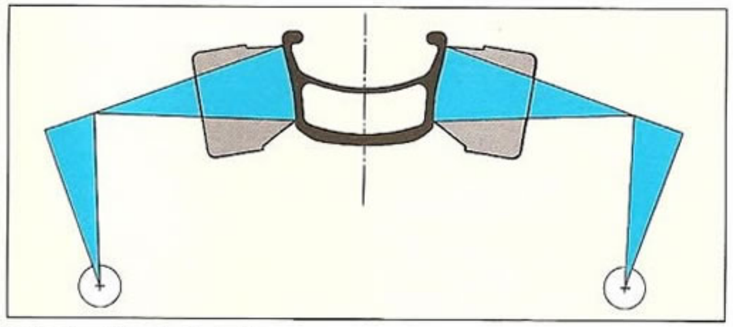


For perfect cantilever braking, the braking surface of the rim must achieve full contact with the blocks, and accommodate progressive block wear. The traditional flat or convex-sided rim wears an angular shape into the block during use, a sign that braking is not even. In order to increase the braking effect with the same force on the brake lever, a new polycentric-type profile has been designed and utilised on all these rims. This innovative and exclusive profile ensures uniform block wear, a higher coefficient of friction and superior braking performance. With the experience gained from off-road cycling, we have also built new rims with a polycentric-type profile for hybrid bikes, since cantilever brakes are also used on this kind of bike.



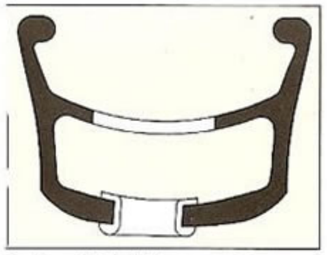
Section of mountain bike rims

Another important aspect in the construction of a rim is its finish. The surface finish plays a fundamental role in increasing the life expectancy of the rim and enhances its mechanical performance. The Campagnolo range has different types of finishes, such as anodising, which are highly resistant to wear and which also augment the mechanical specification of the material used.



Study of cantilever brake braking

The Hardox finish (hard anodic oxidization) with its characteristic dark colour, obtained through a galvanic-chemical reaction, transforms the surface of the rim, and effectively increases the rigidity of the rim itself without compromising its vertical elasticity. Furthermore, resistance to wear caused by the brake blocks and atmospheric agents is also enhanced.



Section of Hybrid rims

Campagnolo offers a rich range of wheels and rims, ideal for all requirements and of proven quality, reliability and performance, in the traditional Campag[illegible]







SIGMA Hardox T

This is the rim used by the professionals, who demand lightness and reliability. The material employed, ERGAL, is a heat-treated aeronautical alloy which possesses very high mechanical properties. As a result of the technologies and materials used, Sigma rims are the rims of choice for competition at the very top.

SPECIFICATION:
Type: Tubular
Size: Ø 28".
Spokes: 32 or 36
Finish: Hard-anodised
Alloy/Treatment: Ergal 7075/T6
Eyelets: Double inclined
Weight: 365 grammes
(without eyelets).





OMEGA 20 Hardox T

Omega tubular rims have been specifically designed for competition use. Made of a high-quality heat-treated aluminium alloy and with a Hardox finish which increases the surface hardness, Omega rims respond perfectly to the constant short bursts so typical of elite amateur races, which are normally highly competitive and fast.

SPECIFICATION:
Type: Tubular
Size: Ø 28"
Spokes: 32 or 36
Finish: Hard-anodised
Alloy/Treatment: Alloy 5086/T6
Eyelets: Double inclined
Weight: 395 grammes (without eyelets).

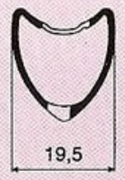




OMEGA V Hardox T

The Omega V is for those who prefer a more rigid, responsive rim. Ideal for short races or climbing, it transmits perfectly all the rider's thrust on the pedals. Its aerodynamic profile, specifically shaped to do away with the need for eyelets, heightens the mechanical resistance of the silico-magnesium aluminium alloy used in its construction.

SPECIFICATION:
Type: Tubular
Size: Ø 28"
Spokes: 32 or 36
Finish: Hard-anodised
Alloy/Treatment: Alloy 6082/T6
Eyelets: None
Weight: 395 grammes (without eyelets).



OMEGA 19

Only recently introduced, the Omega 19 has had great success in competition with riders who prefer narrow-section clincher tyres, like triathletes, who also place great importance on the weight factor. With its characteristics, high performance is assured, especially on short, fast courses.

SPECIFICATION:
Type: Clincher
Size: Ø 26" and 700C
Spokes: 32 or 36
Finish: Hard-anodised,
highly polished in silver.
Alloy/Treatment: Alloy 6082/T6
Eyelets: Double inclined
Weight: 350 grammes (26" without eyelets)
380 grammes (700C without eyelets)





OMEGA 20

This is a rim for narrow-section tyres designed to meet the needs of the most demanding amateurs. Campagnolo's advanced manufacturing technology once again has produced a finish which enhances the quality of the aluminium alloy employed, maximising its resistance to wear and tear.

Specification:
Type: Clincher
Size: Ø 700C
Spokes: 32 or 36
Finish: Hard-anodised,
highly polished in silver.
Alloy/Treatment: Alloy 6082/T6
Eyelets: Double inclined
Weight: 430 grammes (without eyelets).

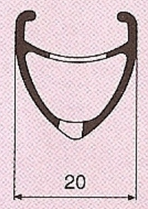




OMEGA V

As in the tubular version, this aerodynamic rim without eyelets makes for very rigid wheels, ideally suited to the numerous fast breaks which characterise amateur races. Its numerous features are sure to please all enthusiasts.

SPECIFICATION:
Type: Clincher
Size: Ø 700C
Spokes: 32 or 36
Finish: Hard-anodised,
highly polished in silver.
Alloy/Treatment: Alloy 6082/T6
Eyelets: None
Weight: 435 grammes.



OMICRON

The Omicron, although drawing heavily on the design features of top-range rims, is aimed at mid-range bikes of indisputable quality and reliability.
It has been designed to enable it to be built-up by hand or mass-assembled by machine.
The choice of material used and its solid construction make it highly resistant to heavy loads.

SPECIFICATION:
Type: Clincher
Size: Ø 700C
Spokes: 32 or 36
Finish: Black Electrox,
anodised and highly polished in silver.
Alloy/Treatment: Alloy 6061/T6
Eyelets: Double inclined
Weight: 480 grammes (without eyelets).



GAMMA

Featuring single eyelets, the Gamma is a traditionally-profiled rim designed to be machine-assembled in great numbers. It has balanced transverse and vertical rigidity which ensures its trueness on leaving the assembly line. The Gamma is ideal for sporting use and touring.

SPECIFICATION:
Type: Clincher
Size: Ø 700C
Spokes: 36
Finish: Black Electrox,
anodised and highly polished in silver.
Alloy/Treatment: Alloy 6061/T6
Eyelets: Single
Weight: 480 grammes (without eyelets).

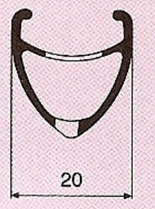




DELTA

Like the Gamma, the Delta has been purpose-built for mass automated assembly in large plants. All the drillings have been accurately carried out to ensure a perfect fit with the machines during build-up. Its aggressive aerodynamic profile make it the ideal rim for low-range race bikes.

SPECIFICATION:
Type: Clincher
Size: Ø 700C
Spokes: 32 or 36
Finish: Black Electrox,
highly polished.
Alloy/Treatment: Alloy 6061/T6
Eyelets: None
Weight: 485 grammes.





STHENO

Aimed at off-road competition use, the Stheno rim walls have the famous polycentric profile which increase the braking effect of the brake blocks. Made of choice materials and specifically designed to be built-up without eyelets, these rims boast high rigidity, resistance and lightness.

SPECIFICATION:
Type: Off-road tyres
Size: Ø 26"
Spokes: 32 or 36
Finish: Hard-anodised, highly polished.
Alloy/Treatment: Alloy 6082/T6
Eyelets: None
Weight: 405 grammes.

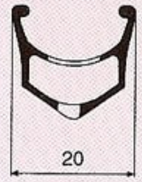




ATEK

With its 20mm section and polycentric wall profile the Atek is one of the lightest off-road competition rims in the world. It has been deliberately designed to allow the fitting and removal of the tyre without using levers, a feature common to all Campagnolo off-road and hybrid rims.

SPECIFICATION:
Type: Off-road tyres
Size: Ø 26"
Spokes: 32 or 36
Finish: Hard-anodised, highly polished.
Alloy/Treatment: Alloy 6082/T6
Eyelets: None
Weight: 390 grammes.



MIROX

For those who prefer a rim with double inclined eyelets, especially to facilitate assembly, the Mirox has been specifically designed to meet the needs of the world's major producers of off-road bikes, in the best possible way.

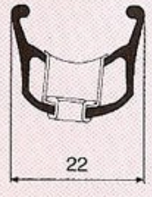
SPECIFICATION:
Type: Off-road tyres
Size: Ø 26"
Spokes: 32 or 36
Finish: Black Electrox, highly polished.
Alloy/Treatment: Alloy 6082/T6
Eyelets: Double inclined.
Weight: 380 grammes (without eyelets).



ZARK

The Zark, with double inclined eyelets, is specifically intended for mass, automated assembly. A rim which also features the polycentric wall profile, its black or polished finish confers a touch of class on any off-road bike.

SPECIFICATION:
Type: Off-road tyres
Size: Ø 26"
Spokes: 32 or 36
Finish: Black Electrox, highly polished.
Alloy/Treatment: Alloy 6061/T6
Eyelets: Double inclined.
Weight: 405 grammes (without eyelets).

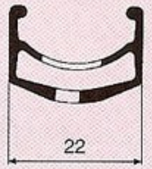




ARKOS

The Arkos is a brand-new rim designed for large-plant mass assembly. The choice of materials and the new design of the drillings make the Arkos ideally suited for automated assembly. Its special finish as well as its wide section make it a very aggressive rim.

SPECIFICATION:
Type: Off-road tyres
Size: Ø 28"
Spokes: 32 or 36
Finish: Black Electrox, highly polished.
Alloy/Treatment: Alloy 6061/T6
Eyelets: None
Weight: 445 grammes.





DEDRA

The new Dedra rims, targeted at the new generation of hybrid bikes, have been built along the lines of our off-road polycentric profile rims, with subtle modifications to enable their use also with traditional caliper-type brakes. Dedra rims are fitted with single eyelets.

SPECIFICATION:
Type: Hybrid bike tyres
Size: Ø 700C
Spokes: 36
Finish: Black Electrox, highly polished.
Alloy/Treatment: Alloy 6061/T6
Eyelets: Single
Weight: 495 grammes (without eyelets).





THE CHOICE OF SUCCESS

Throughout the life of our company, competition has always been the ultimate objective that has enriched our story, the story of the cycling greats and the story of millions of enthusiasts.

Only through constantly being able to meet the most exacting demands of the professional cyclist have we been able to keep our products at the highest level, supporting the greatest international champions and gathering with them splendid victories.



Ever since the launch of our first complete groupset we have garnered countless successes, as our exceptional, unparalleled record shows.

The 1994 season was another triumphant one, with a double success in the Giro d'Italia and the Tour de France, utterly dominated by Evgeni Berzin and Miguel Indurain.

We are proud to say that we too, in our own way, dominated these prestigious events, being there on the bikes of these great riders, alongside them with our philosophy, our infinite passion and the fruits of our work.

The successes of the great champions are also successes for Campagnolo.

TECHNICAL SPECIFICATIONS

		RECORD	CHORUS	ATHENA	VELOCE	MIRAGE	AVANTI	RECORD OR
REAR DERAILLEUR	max. sprocket	26	26	26	28	28	28	
	total capacity	26	26	26	26	26	26	
FRONT DERAILLEUR	braze-on	•	•	•	•	•	•	
	clip-on ø 28,6	•	•	•	•	•	•	
	clip-on ø 32	•	•	•	•	•		
	clip-on ø 35	•	•	•	•	•		
	max. chainring	54	54	54	54	54	54	
	total capacity	15	15	15	15	15	15	
CRANKSET	crank lenghts mm	170-172,5-175-180	170-172,5-175	170-172,5-175	170-172,5-175	170-172,5-175	170	
	toothings	39x52 39x53	39x52 39x53	39x52 39x53	39x52	39x53	39x52	
		41x52 41x53	41x52 41x53	41x52 41x53	42x52 42x53	42x52	42x52	
		42x52 42x53	42x52 42x53	42x52 42x53	39x53	42x53		
TRIPLE REAR DERAILLEUR	max. sprocket	28			28	28		32
	total capacity	37			37	37		36
TRIPLE FRONT DERAILLEUR	braze-on	•			•	•		
	clip-on ø 28.6	•			•	•		•
	clip-on ø 32	•			•	•		Regol. 28,6÷33
	clip-on ø 35	•			•	•		35÷36
	max. chainring	52			52	52		48
	total capacity	22			22	22		22
TRIPLE CRANKSET	crank lenghts mm	170 - 175			170 - 175	170 - 175		• 170 - 175
	toothings	30 x 40 x 50	30 x 42 x 52	32 x 42 x 52	30x40x50 - 30x42x52	30x40x50		30x30x42 - 20x32x42
					32x42x52	32x42x52		22x32x42 - 22x32x44
BOTTOM BRACKET	cartridge type, IT	•	•	•	•	•	•	•
	cartridge type, BC	•	•	•	•	•	•	•
ERGOPOWER		•	•	•	•	•	•	
BRAKE LEVERS	traditional type	•	•	•	•	•	•	•
SHIFTING LEVERS	traditional type	•	•	•	•	•	•	Bullet
								Thumbshifters
BRAKES	height	39÷50	39÷50	40÷51,5	40÷51,5	39÷51	39÷51	Cantilever
FRONT HUB	spoke holes	32 - 36	32 - 36	32 - 36	32 - 36	32 - 36	32 - 36	32 - 36
	O.L.D.	100	100	100	100	100	100	100
FREEHUB	spoke holes	32 - 36	32 - 36	32 - 36	32 - 36	32 - 36	32 - 36	32 - 36
	O.L.D.	130	130	130	130	130	130	135
SPROCKETS	toothings	11/18 11/21	12/19 12/21	12/23 12/25	12/21 12/23	12/25 13/23	13/26 13/28	11/26
		13/21	13/23 13/26	14/26		14/26		
CHAIN	1/2"x3/32"	Silver	Silver	Black	Black	Black	Black	Silver
HEAD SET	BC 1"x24tpi	•	•	•	•	•		•
PEDALS	quick release type	•	•	•		•	•	Traditional type
SEAT POST	diameter	27-27,2	25-26,8-27-27,2	25-26,4-26,6 26,8-27-27,2				

RIMS FOR TUBULAR TYRE	mm.	Drilling	Weight gr.
SIGMA Hardox T	22	32-36	365
OMEGA 20 Hardox T	20	32-36	395
OMEGA V Hardox T	19,5	32-36	395
RIMS FOR CLINCHER TYRE			
OMEGA 19 Hardox 26"	19	28-32	350
OMEGA 19 Hardox	19	32-36	380
OMEGA 19 Silver	19	32-36	380
OMEGA 19 Polish	19	32-36	380
OMEGA 20 Hardox	20,2	32-36	430
OMEGA 20 Silver	20,2	32-36	430
OMEGA 20 Polish	20,2	32-36	430
OMEGA V Hardox	20	32-36	435
OMEGA V Silver	20	32-36	435
OMEGA V Polish	20	32-36	435
OMICRON Black	20,2	36	480
OMICRON Silver	20,2	36	480
OMICRON Polish	20,2	36	480
GAMMA Black	20,2	36	480
GAMMA Silver	20,2	36	480
GAMMA Polish	20,2	36	480
DELTA Black	20	32-36	485
DELTA Polish	20	32-36	485
RIMS FOR OFF-ROAD			
STHENO Hardox	22	32-36	405
STHENO Polish	22	32-36	405
ATEK Hardox	20	32-36	390
ATEK Polish	20	32-36	390
MIROX Hardox	22	32-36	380
MIROX Polish	22	32-36	380
ZARK Black	21,9	32-36	405
ZARK Polish	21,9	32-36	405
ARKOS Black	22	32-36	445
ARKOS Polish	22	32-36	445
RIMS FOR HYBRID/TOURING			
DEDRA Black	23	36	495
DEDRA Polish	23	36	495

N.B.: the weights of the rims do not include the eyelets.

SHAMAL FOR TUBULAR TYRE	Rim cross section	Hub spacing	Weight gr.
front road 26"	19	100	750
front road 28"	19	100	790
rear road 26"	19	130	1045
rear road 28"	19	130	1095
front track 26"	19	100	830
front track 28"	19	100	850
rear track 28"	19	120	940
SHAMAL FOR CLINCHER TYRE			
front road 26"	19	100	800
front road 28"	19	100	860
rear road 26"	19	130	1105
rear road 28"	19	130	1165
VENTO FOR CLINCHER TYRE			
front road 28"	19	100	930
rear road 28"	19	130	1190
ZONDA FOR CLINCHER TYRE			
front road 26"	19	100	860
front road 28"	19	100	980
rear road 26"	19	130	1120
rear road 28"	19	130	1190
BORA FOR TUBULAR TYRE			
front road 26"	20	100	660
front road 28"	20	100	700
rear road 26"	20	130	945
rear road 28"	20	130	990
KHAMSIN FOR TUBULAR TYRE			
front road 26"	18	100	950
front track 26"	18	100	950
rear road/track 28", engl. or it. thread	18	126.5/120	1110
SCIROCCO FOR TUBULAR TYRE			
front road 26"	18	100	980
GHIBLI FOR TUBULAR TYRE			
front road 24"	18	100	740
front road 26"	18	100	820
front track 24"	18	100	740
front track 26"	18	100	820
rear road 28" w/ cassette freewheel body	18	130	1125
rear track 28", engl. or it. thread	18	120	960

Campagnolo SRL reserves the right to modify the product specifications without notice.

I.P.

LIMITED WARRANTY

Campagnolo S.r.l., Vicenza, Italy, warrants that new Campagnolo bicycle products (except tools and lubricants) will be free from defects in materials and workmanship for twelve (12) months from the date of their original purchase.

Campagnolo will either repair or replace, at its discretion, any product found to be defective.

This warranty does not cover: normal wear, improper assembly or use in conjunction with non-compatible products, improper servicing or maintenance, alteration or modification, misuse, abuse, neglect, commercial or competitive use, accident, or damage in shipment.

Campagnolo shall not be responsible for any special, indirect, incidental or consequential damages, whether or not foreseeable. Any implied warranties, including warranties of merchantability and fitness for a particular purpose, shall be limited in duration to the time period set forth above. Some states do not allow the exclusion or limitation of incidental or circumstantial damages or limitation on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you. No one is authorized to modify or extend the terms of this warranty. There are no warranties which extend beyond the description on the face hereof.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Warranty claims can be submitted through the product's point of purchase, parts supplier or directly through Campagnolo S.R.L., Vicenza, Italy.

The return of warranted parts for inspection must be authorized in advance in writing by Campagnolo.

A dated proof of purchase is required.

All Shipping charges to and from Campagnolo are a respopnsability of the claimant.

Any claim outside of the terms of this warranty, or which does not follow these procedures, will be rejected.

We recommend that you review the complete warranty text (of which this is a condensed version), which is included in each product's packaging or can be requested through your dealer, supplier or from Campagnolo S.R.L. at the addresses below.

For further information, please contact:

CAMPAGNOLO S.r.l.
Via della Chimica, 4
36100 VICENZA - ITALIA
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Fax: 0444-348034

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BOUTHEON CEDEX - FRANCE
Phone: 77-556305
Fax: 77-556345

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DEUTSCHLAND
Phone: 02171-768208
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CARLSBAD - CA 92008 - USA
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