BRIDGESTONE
Your Journey, Our Passion

BRIDGESTONE BICYCLE 2013

科学的解析
Scientific Analysis

すべては「人」を知ることからはじまる
Our Constant Theme: Understanding the Human Body

It is just the humans that ride bicycles. In order to ensure that the mere one horsepower that humans are capable of is put to the most efficient use, we have constantly continued to enhance the lightness and strength of bicycles. However, no matter how high the level of performance available, the true performance of the bike cannot be attained if it doesn't match up with the rider's physique. Because of this, it is Bridgestone's belief that our priority should be placed not only on product technology when developing new bicycles, but also on having a full understanding of the human body. We established our own in-house research facilities in 1994 to scientifically analyze the relationship between the human body and bicycles in a Man-Machine Matching project. This enabled us to develop the Bridgestone racing bike in 1998, which represents "Bikes that Win." And, over the course of the past thirteen years, we at Bridgestone have continued to integrate our scientific analyses with the human senses in order to create bikes that get the optimum performance out of their riders.

人の感覚を数値化する
Converting the Human Senses into Numerical Data

The foundation behind Bridgestone's thought process with regard to development is "understanding the rider." This consists of two elements. The first is having a full understanding of the rider's body. Pedaling skill, riding position and the maximum oxygen intake are measured in the Bridgestone Lab in our research facility and then scientifically analyzed. The form and frame geometry for the most effective riding is calculated from the numerical data obtained from this, which provides us with a base for interpreting the impressions and the senses expressed by riders.
The second element is interpreting the opinions of the riders. The impressions of Bridgestone's professional riders, such as, "easy to ride first of all, but soon tires the legs" and "there is no stamina left in my legs for the final sprint," etc., provide us with unique and invaluable data on the way their bodies sense the riding experience.
A simple word like "high rigidity" is interpreted differently by the riders and the developers. It is therefore important to convert the characteristics of the biomechanics of the word into numerical data.
By scientifically analyzing ambiguous interpretations that used to be based on the experiences and hunches of frame builders, developers and riders allows us to repeatedly convert these impressions into accurate numerical data. We at Bridgestone believe that this is an indispensible factor in developing high-grade products and creating state-of-the-art bikes.

正確な応力解析がフレーム性能を最大限に引き出す
Accurately Analyzing Stress Maximized Frame Performance

The ideal frame converts 100% of the rider's power into propulsion force. And, the keyword to this is stress. Frames are subject to a wide range of weak and strong forces during pedaling and cornering, which means that they are constantly distorting as they move forward. It is no exaggeration to say that the way in which this distortion is controlled determines whether performance will be improved or worsened. When Bridgestone developed the Neo-Cot frame at the beginning of the '90s, we implemented a series of basic research into stress. At that time, our understanding of frame stress was based on what the frame builder felt was right from his own experience, and accurate numerical data was not used for analysis. It was then that we used computers to analyze the stress that frames were subject to when traveling using the finite element method (FEM). This taught is that round tubes, which we thought was the optimal shape up until then, contained too much waste. We therefore integrated this data with the experience we had gained conventionally through developing frames to formulate the Neo-Contour Optimigation Theory, which led to the birth of the Neo-Cot.

科学的解析が必要不可欠なカーボン素材
Carbon; Indispensible for Scientific Analysis

Carbon is currently the material of choice for sports bike frames. The reason for this is that it is lightweight and has superior vibration absorption levels, and it can also be freely formed into any frame shape. A combination of different carbon materials also increases strength in local areas, which is beyond the capabilities of steel, and rigidity levels can also be easily adjusted. A scientific approach to the painstaking calculations required to attain the maximum attraction of this material is indispensible, and as far as Bridgestone, which has used this method to ensure that our products are constantly evolving, is concerned, there is no other material that can match up to carbon.
Our basic research into this started with collecting actual data from Japan's top riders with the use of existing steel frames. We built several frame prototypes with different levels of rigidity and then measured the amount of distortion in each. We then analyzed the numerical data obtained from this together with the impressions of the riders in order to determine the optimal levels of rigidity at each part of the frame.

We also run a series of tests known as the L18 Matrix to discover the role each of the tubes plays and to calculate their contribution rates. We prepared eighteen carbon frames and then run approximately 4,000 simulations using different tube combinations to scientifically analyze horizontal rigidity and distortion rigidity.
This basic research has simplified the calculations necessary to determine how many layers of carbon are needed to form the tube and how much rigidity we can expect to obtain.
In addition to enabling us to accurately acquire the levels of rigidity most suitable for the riders, this technology for analyzing optimal structures has drastically reduced the amount of time that we used to require in the trial and error method of developing new products by repeatedly creating conventional prototypes and road-testing them. This new development time has also been instrumental in improving the performance of the products.
Bridgestone products; developed through an integration of scientific analysis and leading-edge engineering.
In the wings of this development is a collaboration with the riders, and listening carefully to their opinions helps us conceive high-performance bikes. We study what our riders, as human beings, are feeling and what they want, and by converting these opinions into numerical data through scientific analysis we learn the essence of the frame development required. And this represents our constant theme.

NEW HUMAN GEOMETRY

NEW HUMAN GEOMETRY
Everybody's bone structure is different, and everybody has a different way of pedaling and positioning. This is emphasized even further when it comes to the differences between Asian people and Europeans and Americans. Amid the many interacting elements, including frame materials, shape and geometry, Bridgestone always finds a way to respond to this. Repeated verifications by top athletes and scientific analysis enable the most suitable bikes to be developed.

HIGH MODULUS CARBON

HIGH MODULUS CARBON
High Modulus Carbon fibers have higher elasticity rates than normal carbon fibers. They are lighter than normal carbon fibers that share the same levels of rigidity, and it is possible to increase these levels of rigidity using the same number of layers and with the weight remaining unchanged.

PRO USE

PRO USE
Specifications for athletes aiming for victory. This is proved by the models for which we ignored the high costs and concentrated only of winning.

NEO-COT

NEO-COT [Neo-Contour Optimigation Theory]
The ideal tube shape conceived with the finite element theory. Neo-Cot is designed based on the neo-contour optimigation theory using such techniques as the spinning butted method to erase all bumps from inside the tube and the rag method in which the pipe itself is blown up to expand it. The chromoly frame, which represents original specifications produced from pipes by Bridgestone, is the starting point of Bridgestone's scientific approach.

"TPC" CARBON composite

TPC [Three PIECES Carbon]
A combination of monocoque casting and adhesion technology allows great freedom in developing the frame shape and size.

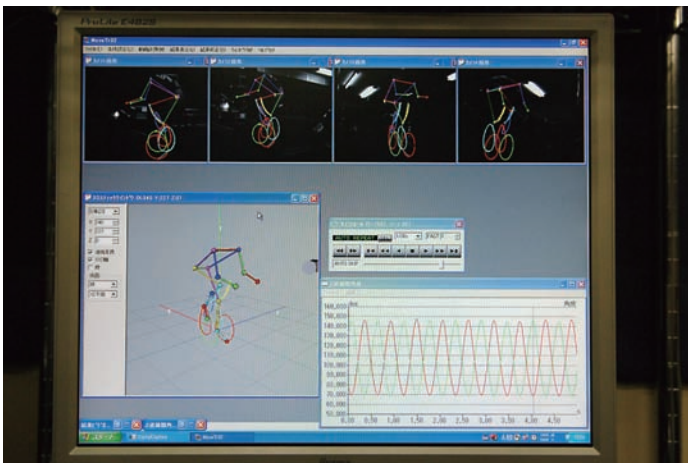
APPROVED uci

A bike prepared for measuring the forces applied to the frame during actual travelling (1997)

小柄な日本人にも最適フィットのスモールサイズ

Small Size Bikes that Fit Short-Stature Asians Perfectly

The average height of Asians is smaller than Europeans and Americans, and the size ratio of their hands and feet against their body is smaller.
This means that they require smaller frame sizes, and making sure a shorter top tube is used is very important. A smaller frame size means that there is less freedom to work on part dimensions, which makes the design stage very difficult, and one method of overcoming these limitations is to use smaller 26-inch wheels instead of the normal 700C. However, we at Bridgestone insist on using the 700C wheel in consideration of maintaining cycling performance and part compatibility. Although it is extremely difficult to use an optimal top tube size while maintaining a balance with cycling performance, we managed to achieve this with an ingenious frame design. This helped us succeed in obtaining a 488mm top tube on a 390mm size bike so that even riders with a height of between 140cm and 150cm can have the optimum frame size and position. There is no doubt that manufacturers who have managed to achieve these numerals using 700C wheels are extremely rare throughout the world.
The Bridgestone Lab is always in quest of the optimal positions that match up with objectives and levels based on scientific analysis, and Bridgestone now has a frame created from a design concept that manages this. It is now possible for all riders, from beginners through to top-class riders, to easily chose the size that is most suitable for their own level. The performance that this provides only exists because we at Bridgestone continue to question high-level bicycle matching with the focus on the rider.



業界屈指のシビアな耐久試験

安心の耐久性

The industry’s most prominent and severest endurance test
High-Durability for Peace of Mind

Bicycles that have passed anything up to 300 endurance tests and safety inspections delivered to users.
The element that we at Bridgestone place the most emphasis on is the simple term “Safety.” Not only do our bicycles go through all of the safety inspections stipulated by the EN standards and JIS (Japanese Industrial Standards,) we also add our own inspections, and only the bicycles that pass these stringent tests are pronounced eligible for sale. For example, the EN standards for bicycle frames require five inspections, including load-dropping impact tests and ergonomic tests on pedal load, but we add four of our own inspections to make a total of nine.
These safety tests are carried out on every frame throughout all sizes that we sell.
These stringent safety tests and attention we at Bridgestone pay to quality control is only made possible through our principle of “high performance can only be achieved on the back on absolute safety and quality control.”

走行性能を左右するフロントフォーク

フレーム設計思想

Front Forks that Affect Traveling Performance

Concept behind Frame Design

サイズごとに最適なオフセットを4種類用意

Four different types of optimal offsets available for each size to provide comfortable handling

It is often said that frames with superior cycling performance generally have well-formed forks, and this remains the same today as it was in the past. This is because the front forks reign supreme over all aspects of the bike's forward movement. Playing opposing roles in enabling the bike to move forward and turn corners provides superior levels of stability and gives the rider a comfortable ride.

The elements that determine operability are known as trail values. The trail values determine three main elements; the wheel diameter, the Head Angle and the amount of fork offset. The Head Angle differs in accordance with the size of the frame, which means that front forks with different amounts of offset for each size are required in order to attain optimal handling performance. We at Bridgestone apply four different types of trail values to different products.

What effects do different trail values have on handling? Self-steering performance is strengthened when the value is increased (Head Angle reduced or "negative," offset reduced or "short.") Despite the level of cornering being greater when the handlebars are turned, the force for returning the front wheel to the straight position is also greater, which provides the bicycle with forward stability. On the other hand, the natural tendency for the self-steering to exert this return force leaves the rider with the impression that bike response is sluggish.

Conversely, when the trail value is reduced (Head Angle increased or "positive," offset increased or "long,") the level of cornering is weaker when the handlebars are turned and the self-steering performance is also weaker. This makes the handlebars feel lighter, but the rider feels a sensation of wobbling and needs to concentrate harder or cycling in straight lines.

The standard trail value for bikes fitted with 700C size wheels is between 55mm and 58mm, but it is said that between 50mm and 64mm is the permissible range for the value. Designs within this range are thought to provide both superior levels of straight-run stability performance and steering.

At Bridgestone, we keep the offset value between 55mm and 58mm for comparatively large frame sizes. However, it is very difficult to establish applicable values for all sizes. For example, the smaller the size of the frame the smaller the permissible range of the trial value, particularly for bikes in the 300mm and upwards range such as the Carbon Road, and this makes setting the value more difficult.

This is owing to the relationship with the front center value that determines the length of the top tube and traveling stability.

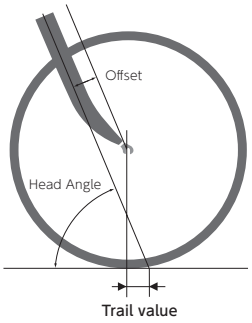
It goes without saying that the top tube on small frame sizes is short. If this is shortened for large-ratio frames, the wheelbase becomes shorter and the bike loses stability. In order to shorten the top tube while maintaining an appropriate wheelbase, it is necessary to set the head angle into positive figures. However, there is one drawback in this that affects the handling design. Installing forks with an offset that is the same as large sized frames results in the trail value becoming too large.

When the trail value increases, the bike' s center of gravity moves forward, which means that movement is sluggish when turning corners. This is not a problem for bicycles that are mostly used for shopping and require heightened levels of stability, but it is not suitable for high-speed bikes, such as road bikes, that require sensitive handling. Also, there is a possibility that the sluggish handling could cause women, who are less muscular than men, to turn the handlebars too late. In consideration of this, Bridgestone developed a special front fork with an offset value of 55mm in order to achieve a trail value of 63.4mm. This is the best value for obtaining stability on straight runs and good steering even on bicycles with small frames, and it provides a well-balanced, comfortable and high-performance ride.

There is a recent tendency to reduce frame sizes in the design stage in order to reduce the number of front fork variations that are needed. This, however, means that optimum steering performance is completely overlooked. It is true that increasing the number of front fork types most suitable for all frame sizes is time-consuming and costly. However, given the fact that front forks are extremely important elements that affect operability, upon which frame performance is determined, we at Bridgestone have developed a lineup of four different sizes without concerning ourselves over how much time it takes. The determination to create bicycles that fit riders perfectly is just one of the factors that Bridgestone insists upon, and it is this that separates us from others.

Trail Value

The trail value is a value that provides a yardstick for estimating the handlingperformance of bicycles. A line is drawn along the central core of the steering tube (center of the front fork's steering column) down to the ground, and the value represents the distance at ground level between this line and a line drawn vertically down from the center of the wheel. This value determines the relationship between the wheel diameter, the Head Angle and the amount of fork offset. The standard trail value for bikes fitted with 700C size wheels is between 55mm and 58mm, but it is said that between 50mm and 64mm is the permissible range for providing well-balanced handling for sports bikes. If the trail value is too large sports bike lose their light sense of operability, and if it is too small stability is lost on straight runs so it is difficult to ride without both hands on the handlebars.



Trail Value Quick-Glance Table (Wheel diameter of 700 x 23C)

Offset \ Head Angle	70	70.5	71	71.5	72	72.5	73	73.5	74	74.5
38	81.5	78.3	75.2	72.0	68.9	65.8	62.7	59.6	56.5	53.5
39	80.4	77.3	74.1	71.0	67.8	64.7	61.6	58.6	55.5	52.4
40	79.4	76.2	73.0	69.9	66.8	63.7	60.6	57.5	54.4	51.4
41	78.3	75.1	72.0	68.9	65.7	62.6	59.5	56.5	53.4	50.4
42	77.2	74.1	70.9	67.8	64.7	61.6	58.5	55.4	52.4	49.3
43	76.2	73.0	69.9	66.7	63.6	60.5	57.5	54.4	51.3	48.3
44	75.1	72.0	68.8	65.7	62.6	59.5	56.4	53.3	50.3	47.2
45	74.0	70.9	67.8	64.6	61.5	58.4	55.4	52.3	49.2	46.2
46	73.0	69.8	66.7	63.6	60.5	57.4	54.3	51.3	48.2	45.2
47	71.9	68.8	65.6	62.5	59.4	56.3	53.3	50.2	47.2	44.1
48	70.8	67.7	64.6	61.5	58.4	55.3	52.2	49.2	46.1	43.1
49	69.8	66.6	63.5	60.4	57.3	54.2	51.2	48.1	45.1	42.1
50	68.7	65.6	62.5	59.4	56.3	53.2	50.1	47.1	44.0	41.0
51	67.7	64.5	61.4	58.3	55.2	52.2	49.1	46.0	43.0	40.0
52	66.6	63.5	60.4	57.3	54.2	51.1	48.0	45.0	42.0	38.9
53	65.5	62.4	59.3	56.2	53.1	50.1	47.0	44.0	40.9	37.9
54	64.5	61.3	58.2	55.1	52.1	49.0	46.0	42.9	39.9	36.9
55	63.4	60.3	57.2	54.1	51.0	48.0	44.9	41.9	38.8	35.8

TRACK

日本ナショナルチームと共に
世界最速に挑み続ける

World-class lightness and rigidity helping the national team to victory

Riders generate momentary maximum output levels exceeding 2,000W when pedaling in world-class track races, and they can cover 1,000 meters in less than one minute. The performance these tough riders demand of their machines during these fiercely competitive races is beyond imagination.

Bridgestone has been supplying materials to Japan' s national team since 2006, which have been used in the World Cup and World Championships. We continue to build machines based on the feedback we receive from these races. This resulted in our TRACK series undergoing a complete model change last year. What riders require in high-speed races is lightweight bikes with high levels of rigidity and instantaneous acceleration to provide them with powerful and sustainable propulsion. TRACK was developed based on these two elements.

This series inherited the highly-acclaimed geometry of the original TRACK bikes. The aerodynamic frame used a three-piece structure created with the carbon technology that Bridgestone has cultivated, and with levels of precision that exceed the single-cell monocoque structures. The head tube was given a blade section based on the Dragon Claw Head tubes that symbolize Bridgestone road bikes. The integral oversize structure provided the high rigidity. And, the seat was mounted on an aero seat post. We placed the emphasis of attaining an aerodynamic structure by fixing the seat pins at the back, etc., and this also contributed to reducing the weight. The shape of the area surrounding the BB, which gives off a sense of volume, also provided it with rigidity. We are very proud of the fact that we managed to attain optimal levels of whip for efficient pedaling during high-power acceleration without generating any unwanted levels of distortion.

All of this helped us to thoroughly revise the rigidity balance to produce an amazingly light bike at just 633g (*) while maintaining aerodynamics. And, of course, we also produced a lineup consisting of the TRACK Type-S for short-distance cycling and the TRACK Type-M for long-distance cycling, each with levels of rigidity that are perfect for their purpose, in the same way as the previous models.

The TRACK series is an integration of Bridgestone' s technology and the high-dimensional performance demanded of world-class races, and it has helped improve the level of the riders on the national team.

NEW HUMAN GEOMETRY　PRO USE　CARBON composite　HIGH MODULUS CARBON

3 PIECES HIGH MODULUS CARBON

CARBON TRACK
TS9 FRAME
TM9 FRAME

Bridgestone has a clear understanding of world-level speed. We supply materials to Japan's national team and have been involved in the World Championships, the World Cup and other top races. The models that are packed with our experience and technology are the TRACK Series. This series was developed to cater to the requirements of high-speed races, which produced lightweight bikes with high levels of rigidity and instantaneous acceleration to provide the riders with powerful and sustainable propulsion. We integrated a blade section shape with the Dragon Claw Head tubes, which obtain optimal levels of rigidity, and formulated a strong front area by increasing its volume together with the forks. This provides stability and prevents power loss during intense periods of sprinting. We also included optimal levels of whip in the hanger area, which is characterized by maximum volume, to provide efficient cycling during powerful pedaling without any unwanted distortion. The bikes' seats are also formed in an overwhelming blade section shape to cut down on wind resistance.
The lineup consists of the TRACK Type-S for short-distance cycling and the TRACK Type-M for long-distance cycling, each with levels of rigidity that are perfect for their purpose, to provide them with the specifications that will help them beat the world.

This model is a special track bike.
It is not equipped with front or rear brakes, so it cannot be ridden legally on public thoroughfares.

Color: Red

* Completed model for reference purposes

SPEC

Model	TS9 FRAME	TM9 FRAME
Frame Size	S-M-L	S-M-L
Frame	3Pieces HM-Carbon TypeS Integral Head	3Pieces HM-Carbon TypeM Integral Head
Front Forks	HM-Carbon Aluminum Column Oversize	HM-Carbon Aluminum Column Oversize
Headset	TANGE IS22 Direct-in Type	TANGE IS22 Direct-in Type
Seat Pin	Hexgon bolt Type	Hexgon bolt Type
Seat Post	Aero-Carbon	Aero-Carbon
Accessories	Special Chain Adjusters	Special Chain Adjusters
Frame Weight	Frame Set: 2,156g (M size) * Excluding seat post	Frame Set: 2,063g (M size) * Excluding seat post
Racing Color	Racing black, Racing red, Racing yellow, Racing orange, Racing lime, Racing sky-blue, Racing blue, Racing pink, Racing silver, Racing dark silver, Racing gold	

Racing Color
11color

パーソナルマッチングが
ライダーの走りを新たな領域へと導く

Personal matching leading riders into new zones

Bridgestone is in constant quest of the optimal relationship between rider and bike in order to ensure victory. The Bridgestone Laboratory has carried out scientific analysis on a large number of rider' s cycling forms, from professionals through to casual riders, with the use of special treadmills and positioning machines. This resulted in us discovering that the optimal riding position and frame geometry does not rely only on physical stature, but also differs in accordance with objectives and experience. In addition, analyses of pedaling indicated that optimal levels of rigidity does not rely only on leg power, but is also greatly affected by differences in riding skill.

Owing to this, the bikes selected by two riders with the same height and weight are naturally different. In order words, we concluded that bikes that provide riding positions, geometry and rigidity levels unique to each individual rider represent the optimal bike for that person. We at Bridgestone therefore established the concept of Personal Matching in order to achieve this ideal, which resulted in the arrival of the RM9 carbon frame for which geometry and rigidity can be ordered.

多様なオーダーを実現するラグ構造

Lug structure enabling diversified orders

We reviewed frame structures from the basic level in order to achieve geometry and rigidity orders with the RM9. The most common type of carbon frame structure at the moment is processed with the so-called 3-piece process, which involves producing a triangle at the front and inserting the seat stay and chain stay. However, this method cannot be used for ordering the RM9 at millimeter-level sizes or rigidity. The RM9 therefore uses a new method of connecting the carbon tubes together with the use of carbon lugs. We have a large number of tube sizes and lug types available, and this enables us to produce order-made carbon frames that make personal matching possible.

幅広いライディングスタイルに対応する7つの剛性

Seven levels of rigidity for a wide range of riding styles

We have established seven rigidity levels from SEL.1 through SEL.7 for the RM9 in consideration of horizontal hanger rigidity and torsion rigidity that differs in accordance with objective, leg power levels and leg types. We have a wide variety of types in which the number of layers of tube carbon can be changed in accordance with differences in rigidity, and the end product consists of a combination of these. Offering seven different types of rigidity variations allows us to use the same frame shape while providing a wide range of riding styles to match up with all types of riders, from sprint riders who prefer high levels of rigidity through to hill climbers who favor lightness. This also provides several thousand combinations of geometry and rigidity and allows bikes to be order made, which is an unprecedented breakthrough with carbon frames that has never been seen before.

オーダーを生かす最新のフレーム設計

Latest frame designs that make the best possible use of individual orders

In order to get the best possible effects out of personal matching, we have come up with the latest frame designs through our unique Bridgestone theory of optimal shapes that is based on stress analysis. The unique Dragon Claw Head shape guarantees that rigidity is reflected onto the top tube and down tube shapes, and this has enabled a tapered style with a lower bearing diameter of 1-1/4 inch to evolve, which has increased the volume of the front forks and improved the accuracy of handling. And, we have sought to achieve an optimum sense of pedaling without any power loss for drive power performance through a combination of a diamond-shaped section in the large-diameter down tube and a triangle-shaped section that represents the chain stay on the hanger shell. This enables swift acceleration without wasting any of the power exerted by professional riders.

We have also used an integral-type seat tube to provide lightness, and we also have a lineup of models that support the latest motor-assisted transmission wiring.

ミリ単位の精度を実現する熟練のハンドメイド

Hand-made by experienced craftsmen who work with millimeter accuracy

The craftsmanship available at the Bridgestone factory allows us to faithfully produce optimal levels of frame geometry and rigidity. Our highly-skilled Japanese frame makers join together the carbon lugs and tubes at incredibly high levels of precision to create order-made carbon frames that are accurate within a millimeter. The skills of our craftsmen are indispensable elements in achieving personal matching for RM9 bikes.

Frames have been order-made ever since the appearance of the Chromoly material many years ago, and this has continued through until today. Attaining the correct levels of geometry and rigidity has conventionally relied on the experience and sixth sense of the makers. However, RM9 personal matching uses accurate figures generated through scientific analyses at the Bridgestone Laboratory to suggest and determine correct match-ups, and this enables us to eradicate all elements of dissatisfaction and unease with regard to riding positions and rigidity. Achieving this through the latest carbon frame designs can only be carried out for the RM9 out of the many road bikes available. RM9 carbon frames into which everything concerning Bridgestone has been instilled improve riding quality through personal matching, which in turn leads onto victory.

NEW HUMAN GEOMETRY　PERSONAL MATCHING　PRO USE　HIGH MODULUS CARBON

HIGH MODULUS CARBON

CARBON ROAD
RM9 FRAME

勝利をもたらすオーダーメイドカーボンフレーム

Order-made carbon frame to bring victory

The RM9 order-made carbon frame to bring out the best of the rider's skills. Our in-house fitting system developed based on personal matching enables us to suggest the best possible positioning geometry based on the rider's individual data and optimal rigidity levels in order to provide exceptional pedaling efficiency. This creates a single bike that perfectly fits the rider's physical attributes and leg strength. The full carbon frame consists of a lug and tube structure that enables fine size adjustment and seven different types of rigidity. A characteristically oversized dragon claw head tube to provide sensitivity, stability and superior levels of handling. And, the shape of the frame with added volume, from the down tube through to the chain stay, converts the power of top riders into efficient propulsion forces. The sense of perfectly matching the rider that personal matching provides will not leave even an iota of doubt in riders aiming for victory.

* Completed model for reference purposes

Photograph Specifications

Frame Size:490mm　Wheels: SHIMANO DURA-ACE WH-9000-C50-CL　Tires:BRIDGESTONE EXTENZA RR-1X　Color: Racing Red

SPEC

Model	RM9 FRAME
Frame Size	On order
Frame	Personal Matching HM-Carbon integrated head
Front Fork	HM-Carbon Monocoque Pro super oversize
Headset	TANGE IS-47LT direct-in type, top: 1.1-8, bottom 1-1/4
Seat Post	RITCHEY ISP WCS STUBBY o34.9 50mm, supports round rails and square rails
Accessories	Manual pack
Frame Reference Weights	Frame only 1,100g (equivalent to 490mm size) * Excluding the integral seat post Frame set 1,550g (equivalent to 490mm size) * Excluding the integral seat post
Reference Completed Weight	7.1kg (equivalent to 490mm size) with pedals 6.9kg (equivalent to 490mm size) without pedals
SHIMANO D12 Specifications	The 9070 and 6770 use SM-JC40 (junction.) The battery mount uses SM-BMR2-S attached to the bottom of the left-hand chain stay. The length of the electric cables (EW-SD50) and the required number differs.
Racing Color	Racing red, Racing black, Racing lime, Racing sky-blue, Racing silver

Racing Color
5color

RS9

メリハリのあるフレーム形状が最適な剛性バランスを生む

Modulated frame shapes leading onto optimal rigidity balance

上下で役割を分ける新たなフレーム設計

New frame designs that separate the roles of the upper and lower parts of the bicycle.

The RS9 high-performance racing model that the Bridgestone Cycling Team use in combination with the RM9. We reviewed the importance of basic rigidity when developing the RS9. Evaluations by our contracted riders indicated that bikes with light swing capabilities, including high levels of responsiveness and dancing, left the most favorable impression with riding performance. Analyses of this from the viewpoint of rigidity indicated that the level of torsion rigidity affected the bike' s acceleration and light swing capabilities and that the level of horizontal rigidity affected pedaling and acceleration performance, etc., but we discovered that it could lead onto leg fatigue if the levels were set too high. In other words, high-dimensional balance between torsion rigidity and horizontal rigidity is indispensable for achieving excellent riding performance.
Although we had considered this balance in the past, we aimed at even higher levels in the development of the RS9 and used a new method. We clarified the parts that provide frames with high rigidity and the parts that provide suppleness and then increased their efficiency levels.

メリハリのあるチューブ形状で剛性バランスを追求

In quest of a balance in rigidity through modulated frame shapes

The most important factor for increasing rigidity is to reinforce the bottom line from the head tube through to the chain stay. We therefore used a tapered head tube with the bearing diameter at the bottom widened to 1-1/4 inches, and a hangar shell that has been expanded by using the press-fit type. We also revised the shape of the down tube to a new triangular cross-section. These attempts greatly improved bottom line rigidity and heightened drive power performance in such areas as providing better acceleration.
The use of tapered head tubes increases rigidity at the front and provides precise and superior levels of handling, but this also results in increased volume in the crown shape, which is reflected back onto the fork blades and reduces comfort. To correct this, we made the horizontal part of the fork blades flatter and thinner to gently absorb upward jolts from the road surface and achieve high levels of shock-absorption in order to reduce damage to the upper body to a minimum.
For the upper line, which runs from the top tube through to the seat stay, we came up with a design in which the diameter of the tubes was reduced in order to attain a balance with the bottom line, which has been reinforced with increased volume. This is because tubes with large diameters apply too much rigidity to the overall frame, which places a heavy burden on the rider. In particular, we made the top tube thinner, thinned down the seat stay and created a shape with reinforced flatness in the horizontal direction. Giving intense consideration to the shape of the tube resulted in a reinforced suppleness that included high levels of shock-absorption while maintaining the necessary rigidness.

カーボン技術の積み重ねによる940gの軽量性

Weight reduced to 940g through the accumulation of carbon technology

The RS9 calls for a tube shape that is in alignment with the required levels of rigidity, so we used high-modulus carbon with different levels of elasticity to make sure that we were able to finely control each layer. In addition to concentrating on the shape of the frame, which affects rigidity and comfort, we also employed a design that makes the best possible use of the characteristics inherent with carbon on the RS9. This accumulation of technology helped us attain greater lightness so that the weight was reduced to 940g.

実戦からフィードバックされた細部の設計

Detailed designs based on feedback from the battlefront

We produced details of each rider' s physical attributes to establish finely-detailed specifications. These specifications took into account maintainability, such as the fact that we built the shift wire into the down tube to protect it from mud and dirt, but the wire on the chain stay was left exposed as it easily became disconnected owing to initial stretching. The built-in lever touch, over which we were anxious, needed to be angled where the wire enters and exits, which reduced the resistance. Also, the motor-assisted gear cable can be inserted into the head if the small fitting at the wire entrance and exit is removed, and this enables a single frame to be used as a mechanical component.
It was also necessary to establish total balance in addition to simply increasing the rigidity in order to guarantee both sharp responsiveness and pedaling that placed little burden on the legs. We then integrated this at a high dimension when dancing, which produces a sense of lightness, superior levels of shock-absorption and highly accurate handling. Raising the riding quality to new levels has provided both victory and a sense of delight to professionals and all other riders.

ダウンチューブ　Down Tube

Large-diameter down tubes formed in triangular shapes contribute greatly to strengthening the bottom line, and this produces increased torsion rigidity, sharp acceleration and sharp bike swing when dancing. The specifications include the shift wire being built into the down tube. By removing the small fitting at the wire' s entrance and exit, a single frame can then be used with both motor-assisted gear and mechanical gears.

ヘッドチューブ&フォーク　Head and Forks

A tapered down tube with different diameter bearings at the top and bottom has been used to increase the outer diameter of the down tube. The bottom bearings keep weight increases to a minimum, and this diameter has been set at 1-1/4 inches in size in order to increase the effectiveness of the tube' s outer diameter. This strengthens the joints on the head tube and down tube, as well as the rigidity near the fork crown, to improve acceleration and control. We also used a wing-section formation for the fork blades, which softens uncomfortable jolts from the surface of the road.

ハンガーシェル　Hanger Shell

Press-fit hanger shells have been used. These are wider than threaded types, and this extra wideness can be used to its full benefit when being connected to the down tube, which provides high levels of torsion rigidity to a part on the hanger. Making the opposing seat tube thinner controls warping in horizontal rigidity, which reduces the load on the riders' legs. An optimal balance between torsion rigidity and horizontal rigidity provides superior levels of pedaling that is more efficient and more comfortable.

ハンガーシェル&チェーンステー
Hanger Shell and Chain Stay

Not only does the press-fit hanger shell control rigidity, it also contributes greatly to reduced weight. Strengthening the bottom line is achieved with large-diameter head tubes and down tubes, and with chain stays with triangular forms. Adding ribs to the hanger shell' s joints keeps the weight down while maintaining the necessary rigidity. The battery required to power the motor-assisted transmission is attached beneath the left-hand chain stay.

NEW HUMAN GEOMETRY　PRO USE　CARBON composite　HIGH MODULUS CARBON

3 PIECES HIGH MODULUS CARBON

CARBON ROAD
RS9 FRAME

世界と渡り合うための軽量カーボンモデル

Lightweight carbon model for taking on the world

The RS9 carbon model represents the optimal ready-made bike that is on a new quest to provide the performance needed to win through in professional races. The frame design provides obviously unprecedented levels of rigidity and suppleness, and we have improved maneuverability. The frame is extremely lightweight at just 940g (460mm size.) This bike will supply the rider with a definite advantage in winning top-level races with its high-dimensional integration of speed, comfort and lightness. We hope you will give this amazing package a try when taking on the world.

* Completed model for reference purposes

Photograph Specifications

Frame Size:490mm　Wheels: SHIMANO DURA-ACE WH-9000-C35-CL　Tires:BRIDGESTONE EXTENZA RR-1X　Color: Racing Red

SPEC

Model	RS9 FRAME
Frame Size	430, 460, 490, 520, 550mm
Frame	3-piece HM-Carbon integral head, Pressfit BB
Front Fork	HM-Carbon Monocoque straight type, super oversize
Headset	TANGE IS-47LT direct-in type, top: 1.1-8, bottom 1-1/4
Seat Pin	ϕ 34.9 band-type
Accessories	LED lamp, bell, reflector, Allen key, valve adapter, manual pack
Frame Weights	Frame alone 940g (460mm) Frame set 1,400g (460mm)
Racing Color	Racing red, Racing blue, Racing silver

Racing Color
3color

NEW HUMAN GEOMETRY HYBRID

HYBRID ALUMINIUM + CARBON

ALUMINIUM + CARBON ROAD RC6 FRAME

アルミハイブリッドで目指したレーシング性能

Targeted racing performance achieved with aluminum hybrids

The RC6 racing model, which is a direct descendent of the RM9, uses a combination of an aluminum frame and a carbon seat stay. This was designed completely, from the tubes upward, in-house in order to get the very best out of the light pedaling characteristics provided by aluminum. The tapered head tube with the lower bearings widened to a diameter of 1-1/4 inches and carbon forks with increased volume provide sensitive and accurate balance, which results in superior levels of handling. The triangular down tube, which is formed with an overwhelming thickness, increases the rigidity of the hanger and generates pedaling with little power loss and sensitive acceleration. Riding comfort is also guaranteed by the monocoque full-carbon front forks and carbon seat stay. The result of our quest into a racing performance that transcends the class is the RC6. We hope that all riders involved in road races will get the chance to experience this superior performance.

* Completed model for reference purposes

Photograph Specifications
Frame Size:490mm Wheels: FULCRUM RACING3 Tires:BRIDGESTONE EXTENZA RR-2X Color: Racing Red

SPEC

Model	RC6 FRAME
Frame Size	460S, 460, 490, 520, 550mm
Frame	SQ-shape Aluminum + Carbon A6061 Integral Head
Front Fork	Carbon Monocoque straight-type super oversize
Headset	VP/A66ACK direct-in type Top 1-1/8, Bottom 1-1/4
Seat Pin	ϕ 34.9 band-type
Accessories	LED lamp, bell, reflector, Allen key, valve adapter, manual pack
Frame Weights	Frame alone 1,550g (490mm) Frame set 2,010g (490mm)
Racing Color	Racing red, Racing black, Racing lime, Racing sky-blue, Racing silver, Racing blue, Racing yellow, Racing orange, Racing pink, Racing dark silver, Racing gold

Racing Color
11color

RL8

軽快な走行性能を際立たせ、ヒルクライムやロングライド、ロードレースまで幅広く対応するマルチロールバイク

A multi-purpose bike with comfortable and sharp riding performance for a wide range of uses, from hill climbing to road races.

ラグジュアリーなフォルムと走行性能を目指して

Aiming at a luxurious form and superior riding performance

The RL8 is the new model that is receiving the most attention from among our 2013 road line-up. Aimed at hobby cyclists wishing to try their hand at hill climbing and long rides, this model continues on from the RFX8, which enjoyed enormous popularity. Comfortable road bikes are being released by many companies at the moment, but there are many cases in which the emphasis has been placed solely on comfort, with lightweight bearings and sensitive operability, which bring out the best in road bikes, appearing to have been overlooked. The RL8 was developed in order to attain optimal comfort on long rides while at the same time maintaining the high levels of dynamic performance that is expected of racing bikes.

RIS9のコンセプトを受け継ぐ基本設計

Basic design inherited from the RS9 concept

In the same way as the RS9, the RL8 was developed based on controlling rigidity with the use of a frame equipped with modulation at the top and bottom. Additional space was added to the area where the tapered head on the head tube, which has 1-1/4 inch diameter bearings at the bottom, is joined to the down tube, and the volume of the fork crown was increased. This enabled us to reinforce the power line, which results in sharp handling and more efficient pedaling. However, the design also includes a down tube with a diameter that is slightly smaller than the RS9. This prevents the levels of horizontal rigidity on the hanger being higher than necessary, and it has been reduced by approximately 20% in comparison with the RS9. This design provides hill climbers with comfortable levels of pedaling that places very little burden on the legs.

優れた乗り心地を生むフレーム形状

Frame shape providing superior comfort

There is a great difference between the diameters of the upper and lower tubes on the RS9 frame. However, this difference has been reduced in both tubes for the RL8. This is because the balance between the power line and rigidity is more suitable with smaller diameters. The upper tube has also been designed in an arch shape, with the seat stay in particular being given a flatter shape in the horizontal direction, which produces a better spring-like effect, and this enabled us to achieve more comfortable rides during which the rider is protected from road surface bumps.
The front forks on both the RS9 and RL8 have been designed comparatively thin, and even our contracted professional riders have claimed that the blades “eradicate lower-body fatigue.” When this is combined with sharp handling, the RL8 becomes the optimal bike for the levels of performance we were trying to achieve.
The only way that we could attain the high levels of Bridgestone technological skills was to use a basic design inherited from the RS9, which prevents race performance deterioration and provides the high levels of comfort that we were aiming at.

軽量モデル

Lightweight model

The weight of the frame is approximately 980g (480mm.) The bike was developed with a large safety margin by using a thread-type hanger shell, which provides superior performance for fixing BB parts in place, and a derail lever hanger made of aluminum, which is stronger than carbon in consideration of the bike being dropped and other accidents, and yet still managing to maintaining such levels of lightness is a tribute to Bridgestone’ s amazing carbon technology prowess.

フレームのラインを際立たせる美しいフォルム

A beautiful form with a conspicuous frame line

From the point of view design, strengthening the levels of volume over the RS9 has provided the bike with an effect in which the silhouette of the entire frame stands out. We have also used a built-in system for the wires and brakes to emphasize this silhouette to its maximum benefit, and it is possible to use both mechanical gears and motor-assisted gears by removing the small fitting at the entrance to the gear shift. As can be guessed from the attention we pay to such details and traveling performance, we have not only concentrated on the design of the frame shape with the RL8, but have also equipped it with a practical balance of functional beauty.
The RL8 is based on the RS9 concept and the performance levels required by hobby riders have been redefined. In addition to improving lightness and comfort, we have also fitted it with maximum levels of dynamic performance that can be found on racing bikes, and this not only provides enhanced advantages to hill climbers and long riders, but also to hobby riders involved in road racing and endurance racing.

ダウンチューブ　Down Tube

The outer diameter of the down tube is smaller than the RS9, but it has been equipped with sufficient volume. The head has been formed to closely resemble a triangular shape to fit the width of the tapered head, and then then changes to a square cross-section as it moves toward the down tube. Although difficult to see with the naked eye, the design bends slightly inward to provide greater comfort. The entrance for the built-in shift wire has been moved to the top to provide a lighter touch when operating the gear lever.

ヘッドチューブ＆フォーク　Head and Forks

A tapered style for which the diameter of the bottom bearings has been set at 1-1/4 inch has been used for the head tube. This has enabled the area of the joint with the down tube to be made wider and the volume of the fork crown to be increased. Drastically increasing the rigidity of the front area has improved handling and acceleration when dancing. Flat, straight fork blades with emphasized width in the vertical direction have also been used. This improves shock-absorption qualities to provide sharper handling.

ハンガーシェル＆チェーンステー

Hanger Shell and Chain Stay

A mono-type seat stay has been used to attain comfort. It has also been formed in an arch shape with the horizontal direction made thicker and the vertical direction made thinner. By providing the bike with the spring-like effects available with flexible responsiveness against load weight, we have enhanced the swing-reduction characteristics that carbon provides. We have slightly reduced the outer diameter of the chain stay in alignment with the slimmer down tube in order to adjust the balance, and the square form near the hander shell provides optimal control over torsion rigidity on the hanger to enhance pedaling efficiency.

3 PIECES CARBON

CARBON ROAD
RL8 FRAME

We will take on all rivals through endurance, aiming at breaking hill-climb and long-distance ride records. There is no limit to the demands that come from hobby riders.The CARBON ROAD series displays the highest levels of achievement of all Bridgestone's road lineups. Using the Dragon Claw on the full carbon frame as a motif, the power line is designed to prevent anything from hindering propulsion, and it provides levels of rigidity to get the most efficient results from the legs of hobby riders.

We also aimed at providing total comfort from the top tube through to the top line of the seat stay. This performance will suit not only long-distances rides and hill climbing, it is also fitted with high levels of general-purpose specifications to suit even road races. A small sized model of 390mm is also available to provide the optimum positioning for riders of between 140cm and 150cm in stature.

* Completed model for reference purposes

Photograph Specifications
Frame Size:480mm Wheels: FULCRUM RACING3 Tires:BRIDGESTONE EXTENZA BICOLORE WHITE Color: Racing White

SPEC

Model	RL8 FRAME
Frame Size	390, 420, 450, 480, 510, 540mm
Frame	3-piece Carbon integral head
Front Fork	HM-Carbon Monocoque straight type, super oversize
Headset	TANGE IS-47LT direct-in type, top: 1.1-8, bottom 1-1/4
Seat Pin	ϕ 34.9 band-type
Accessories	LED lamp, bell, reflector, Allen key, valve adapter, manual pack
Frame Weights	Frame alone 980g (480mm) Frame set 1,440g (480mm)
Racing Color	Racing white, Racing red

Racing Color
2color

Bridgestone road bikes were first conceived in 1998. However, there is one model that was conceived before that and has been proudly used as the base model for other bikes for approximately twenty years. That model is the chromoly frame Neo-Cot. This frame overflows with originality and brings out the very best of the chromoly material's characteristics, and it continues to be utilized to the best effect even in our most up-to-date lineup to support a huge number of riders. It would be no exaggeration to call it Bridgestone's immortal creation.
This all started with the MTB. In the heyday of the chromoly frame in the latter half of the 1980s, it became common to use this material because of the popular MTB, which also used it. The MTB frame was subject to enormous stress because of the continual gaps when riding on dirt trails, so we used oversized tubing with a larger outer diameter than road bikes in order to increase the rigidity and strength. Increasing the levels of strength and rigidity was a great success, but it was difficult to
exploit the sense of agility that is characteristic of the chromoly material to its fullest, and it also increased the weight, which placed a higher burden on the riders. Because of this, our Bridgestone team of developers set to work to devise a more efficient frame.

丸型チューブからの脱却を成功させたバルジ成型

Bulge forming that helped us move away from rounded tubes

The first stage of development involved revising the tubes. Although we had carbon, aluminum and titanium to choose from, we selected chromoly because of its high processing capabilities and because of its superior cost effects. Product development did not rely on material priority alone; we also thought that providing a product incorporating leading-edge technology at a price that would be affordable for users would also give the bike added value.
Chromoly frames generally consisted of round cross-sectional tubes in those days. The reason for this was that it was able to provide well-balanced levels of rigidity to cope with the stress that was applied from all directions and because it was easier to manufacture. However, we at Bridgestone run a series of verification tests to discover if this really was the optimum shape. We simulated actual riding conditions and then analyzed the data with computers and discovered that the stress was not being applied equally throughout the entire frame, but in large quantities in specific areas. In other words, although rounded cross-sectional tubes were continually thought to be the most efficient shape, in actual fact this shape incorporated large areas of waste.
The highest levels of stress were applied to three areas; the head, the seat and the hanger. We decided that increasing the size of the outer diameter of these areas and decreasing the size of the other areas in accordance with the levels of stress to which they were subject would produce the ideal tube shape. However, it was extremely difficult to apply this to the tubing with the tube formation method available at that time. We therefore used a new method, known as bulge forming. This involved placing the tube in a metal mold and fixing it in place at both ends and then injecting liquid in at ultra high pressure in order to form the required shape. This method is currently used mostly for aluminum frames under the name of hydro-foaming, but Bridgestone was using this technology more than twenty years ago, which just goes to show the state-of-the-art technology that went into producing the Neo-Cot.
The tubes that were produced with the use of bulge forming were made into rhomboidal, triangular and other shapes in accordance with require rigidity levels and then given a complex cross-sectional shape. Different cross-sectional tubes are thought to be the norm nowadays, but at the time this was an epoch-making shape. In addition to this, we also expanded the large diameter at both ends of the tube into a trumpet shape. We then laser-cut them precisely into the required shape and incorporated them with lugs, turning them into innovative and very original tubes. We then increased the rigidity in the tube joints and other areas that required it and omitted the lugs that were common in conventional models in order to reduce the weight. We were also able to reduce the number of joints in comparison with normal lugged frames, which minimized heat deterioration of the tube during frame production and brought out the best in the chromoly material. And this completed the ideal Neo-Cot original tubing that our development team was after. Frames that use these tubes are named the Neo-Cot after the full name of Neo Contour Optimization Theory, and the Wild West Neo-Cot DX MTB model was released onto the market in July 1991.

軽量化と高剛性を両立するスピニングバテッド加工

Spinning butted processing to attain both lightness and high levels of rigidity

The Neo-Cot is not only the ideal structure for the MTB, it is also perfect for road bikes. However, the thickness of the tubes when used unmodified with road bikes is over-spec, and the weight causes problems. The development team was therefore faced with a new problem.
Conventional tubes are processed with a technology knowing as "bating," which increases the thickness where rigidity is required and shaves away the thickness in other areas. However, this process leaves bumps inside the tube caused by the differences in thickness, and this places an obstacle in the way of achieving increased lightness. We therefore got the computer to reproduce the ideal tube thickness, and then developed a new method for forming this, known as "spinning butted processing." This consists of a roll inserted into the spinning tube to change the thickness as if scraping it away. The work involved in this smoothes away the bumps within the tube and produces a lightweight tube with a smooth inner thickness.
Having produced the ideal tube that had increased rigidity and was lightweight allowed us to introduce the Neo-Cot Chromoly Professional road bike to the market in 1993. This frame had an amazing 7% increase in rigidity and 40% increase in dynamic rigidity in comparison to conventional types, which used rounded tubes. What is also attracting attention is the fact that there are three types of frame rigidity (only one type available at the moment)—hard, medium and soft types—so that the riders can chose their preferred level of rigidity.
The basic research into rigidity behind the development of the Neo-Cot caused us at Bridgestone to discover that the optimum frame rigidity for riders differed in accordance with the strength of their legs. The ultimate Neo-Cot chromoly frame, produced with varying cross-sectioned tubes created with bulge forming, made lightweight with spinning butted processing and incorporating other creative methods, is still used unwaveringly today after twenty years and is applied to our latest models made of carbon steel. And, the triumphs of Neo-Cot don't end there. Neo-Cot's Neo Contour Optimization Theory, which eradicates waste, creates optimal levels of rigidity where it is needed and reduces weight, is the future of frames and will always provide the ideal designs for producing the latest frames with the popular carbon material. Neo-Cot represents the cornerstone of Bridgestone's sports bike production, and it is therefore irreplaceable.

Neo-Cot tubing process. The tube formed right through to the lugs from a single pipe.

〈Bulge Forming〉
The pipe is placed in a metal mold and hydraulic pressure applied from inside to blow out the walls of the pipe and form its shape. The pressure is applied to the pipe from both ends to form it, so the thickness is equal.

〈Cut & Barring Process〉
The extraneous parts from the bulges are cut away and the angle for the lugs formed.

〈Lug Cut〉
Cut with a laser to the required dimensions. The photograph shows the lug for the seat on the top tube.

Note: The photographs may differ from actual products.

NEW HUMAN GEOMETRY NEO-COT

NEO-COT Cr-Mo PROFESSIONAL

STEEL ROAD
RN7 FRAME

The Neo-Cot frame is the jewel in the crown of Bridgestone's in-house technology, and a similar product cannot be found anywhere else in the world. The tubes are created with many processes, including spinning bating, bulge forming and laser cutting, and are then finished off in our own characteristic form that incorporates both complex cross-sectional shapes and lugs. Ensuring that the tubes have optimal levels of rigidity in the places where they need it provides them with the stiffness that forms their core and provides the rider with a gentle range of flexibility. Chromoly steel, to which the front forks are joined with a traditional soldered crown, and two types of carbon known for their lightness. The RN7 boasts a springiness and stretchiness that can be provided only by steel. We hope that as many riders as possible get the opportunity to experience these levels of performance.

* Completed model for reference purposes

Photograph Specifications

Frame Size:480mm Wheels: SHIMANO WH-R501-30 Tires:BRIDGESTONE EXTENZA RR-2X Color: Racing Red

SPEC

Model	RN7 FRAME
Frame Size	490, 510, 520, 530, 540, 550, 570, 590mm
Frame	Neo-Cot Cr-Mo Professional
Front Fork	Cr-Mo by wax welding
Headset	TANGE RDC Ahead Italian Size
Seat Pin	5mm Hexagon bolt
Accessories	LED lamp, bell, reflector, Allen key, valve adapter, manual pack
Frame Weights	Frame alone 1,670g (530mm) Frame set 2,670g (530mm)
Racing Color	Racing yellow, Racing orange, Racing lime, Racing sky-blue, Racing blue, Racing pink, Racing black, Racing silver, Racing dark silver, Racing gold, Racing red

Racing Color
11color

NEO-COT Cr-Mo STANDARD

STEEL ROAD
RN3 FRAME

心も体も満たすネオコットクロモリのエントリーモデル

The NEO-COT chromoly entry model that will satisfy body and mind

The tube processing methods for the RN3 have been simplified over those used for the top-class RN7. We have also used the TIG method for welding so that we can provide riders across a wide range of levels with the attractiveness of NEO-COT. However, the silhouette of the frame for which the tubes have been formed through bulge forming will leave nobody in doubt that it is NEO-COT. The organic design that resembles the skeleton of an animal provides superior functionality in addition to a unique beauty. The balance between a supple yet sturdy rigidity and enhanced cost performance is as valuable as a gold ratio. A riding performance no different for its conventional steel performance will make this model an optimal partner for long rides and touring and the simple yet delicate frame is sure to satisfy both the body and the mind of the rider.

* Completed model for reference purposes

Photograph Specifications
Frame Size:480mm Wheels: SHIMANO WH-R501-30 Tires:BRIDGESTONE EXTENZA RR-3X Color: Racing Black Amethyst

SPEC

Model	RN3 FRAME
Frame Size	490, 510, 530, 550, 570mm
Frame	Neo-Cot Cr-Mo Standard Spinning-butted
Front Fork	Cr-Mo uni-crown Italian size
Headset	TANGE STR ahead Italian size
Seat Pin	5mm Hexagon bolt
Accessories	LED lamp, bell, reflector, Allen key, valve adapter, manual pack
Frame Weights	Frame alone 1,870g (530mm) Frame set 2,870g (530mm)
Racing Color	Racing Black amethyst, Racing spice orange

Racing Color
2color

XS9

世界のXCレースを勝ち抜くために革新されたフレーム剛性

Innovative Frame Rigidity to Score Victory at the World’s XC Races

Innovative stiffness. This is the development theme of the CARBON MTB series, which represents Bridgestone’s MTB flagship.
When the conversation turns to frame rigidity, horizontal hanger rigidity in relation to pedaling is what gains the most attention. However, what the professional riders contracted to the Bridgestone MTB Team demanded of our development team was improved rigidity on the areas that affect handling and other operations. Insufficient rigidity in these areas during the high-speed world XC races contributes to delayed handling, which leads to decisive differences in downhill sections. This is the opinion of the world’s top racers, and it is based on the experiences of our contracted professional riders after improvements when they took part in the World Championships and the World Cup. Lending an ear to these opinions, we began developing a completely new XC bike complete with superior levels of handling performance.
We changed the shape of the top tube of the XS9 frame from the conventional rhomboidal shape to a triangular cross-section shape, and changed the top of the seat stem from the mono-type shape to a double-type shape to expand the width. This strengthened the horizontal rigidity of the frame’s top line. We then used a tapered head tube with a 1.5 diameter, reduced by one, which greatly contributed to improving the rigidity of the head, which our riders said was something that definitely had to be done. We also increased the diameter of the bearings so that the riders can sense the bike’s contact with the ground better, and because this increased the load on the bearings, we also improved their levels of durability.
In addition to redesigning the rigidity levels in the top line and head areas in this way, we also tackled the 100mm traveling of the front suspension, which has become the norm in XC races. Attaching a 100mm model to a conventional frame with 80mm travel causes the frame to rise up toward the rider. This results in the head tube laying flat, which leads to the sharpness in the handling being lost. In order to combat this, we redesigned the geometry of the head tube, which is the cause of the problem.
On the other hand, the horizontal rigidity of the hanger, which controls pedaling, was considered to be sufficient with the conventional XS9, so the only amendments made here were to review the shape of the down tube and adjust the rigidity balance. The reason for this was because strengthened rigidity tends to place an additional burden on the legs of the riders, which adversely affects riding efficiency.
The meaning behind rigidity for horizontal movement on the front section, including the suspension and handling, is easily understood. On the other hand, it is difficult to know how to cope with horizontal movement on the rear section. If the front of the frame is too rigid, the rear section is easily distorted during cornering, which leads to a loss of operability because the front wheel and rear wheel are traveling in different directions. In order to create an ideal situation in which the front and rear wheels travel on the same axis it is necessary to ensure that the front and rear of the frame share the same levels of distortion rigidity. We therefore solved the problem by not only balancing the front section, but also the overall rigidity in the front and rear sections in order to obtain optimal levels of operability.
In consideration of this new design, we revised several areas of the XS9, from the compounds used for the carbon materials through to the layup. This resulted in the sizes being increased by one in comparison with the previous XS9, to 380, 440 and 500m. While basing the new geometry on the conventional models, we set new dimensions to cover the deficiencies and were able to achieve the best possible riding position for even female and small-stature riders. The XS9; the culmination of refining rigidity under the title of “Innovative Stiffness.” Improving control has provided the riders with more freedom when cornering and on downhill sections and achieved high levels of accurate control and cycling efficiency throughout the entire duration of races. And we will continue to improve the XS9 for world-standard XC racers.

ダウンチューブ　Down Tube

The down tube has been newly designed in a triangular cross-section shape. The bottom part of the larger head tube has been boxed to enable it to be integrated with the top tube, and this contributes to heightened rigidity in the head area. On the other hand, we wanted to avoid increasing the rigidity of the hanger area more than necessary, so minutely controlled the shape of the tube.

ヘッドチューブ&フォーク　Head and Forks

We newly mounted a tapered head tube with a large diameter reduced by one to 1.5. Leaving vestiges of the Dragon Claw Head on the upper part of the head tube, we made the top tube support the head tube horizontally in order to reduce distortion. We increased the area where the down tube comes into contact with it in order to increase the volume. This improved rigidity in the head area to provide stable handling performance at high speeds. We also used a combination of suspension forks with 100mm traveling to increase cycling characteristics.

BB周り　BB Area

The shape of the front of the chain stay inherited the square cross-section from the previous model. However, we narrowed the size of the cross section by 2mm in a horizontal direction to make sure that the rigidity of the hanger was not excessive.

NEW HUMAN GEOMETRY　PRO USE　CARBON composite　HIGH MODULUS CARBON

3 PIECES HIGH MODULUS CARBON

CARBON MTB
XS9 FRAME

The XS9 is a world-spec XC bike that caters to the demands of the Bridgestone Racing Team, which competes on the world stage. The three-piece monocoque frame, which has achieved high levels of precision owing to the use of modulus carbon, is extremely light at just 1,180g. The tapered head tube, which uses 1.1/2 inch lower bearings, has been designed with specifications that provide accurate bike control during high-speed XC races. The increased rigidity makes it possible to actively use square cross-sectioned tubes, but to prevent this from being too rigid, we have slightly down-sized the joints for the down tube and hanger shell. These specifications provide the rigidity to cope with hard road surfaces and the comfort to satisfy the riders. All of the XS9 specifications help to achieve victory.

* Completed model for reference purposes

Photograph Specifications
Frame Size:440mm　Wheels: SHIMANO WH-MT15　Tires:BRIDGESTONE　Color: Red

SPEC

Model	XS9 FRAME
Frame Size	380-440-500mm
Frame	3Pieces HM-Carbon　Integral Head　Super Oversize up1-1/8　down1-1/2 without caliper pivot hole for Rear Cantilever Brake
Headset	TANGE IS245L Direct-in Type
Seat Pin	Φ34.9 Band Type
Frame Weight	Frame only 1,180g (440mm)
Racing Color	Racing Red, Racing Black

Racing Color
2color

NEW HUMAN GEOMETRY NEO-COT

NEO-COT Cr-Mo PROFESSIONAL

STEEL MTB
XN7 FRAME

The ability to battle against nature is part of the charm of the MTB. Personal techniques and physical fitness can be used to conquer all types of trails. The XN7' s Neo-Cot frame smoothes the shocks of off-road cycling to conserve physical stamina, and it has high levels of operability to provide the rider with accurate road information. Chromoly is a material with the ability to appear like suspension, and this characteristic provides a flexibility that cannot be found in carbon or aluminum. And, our in-house bulge forming and spinning bating technology helps to spur these characteristics to even greater heights. The fine tube-work does not only look attractive, it also expands tire clearance and provides additional strength during muddy conditions. When riding the XN7, riders can forget about fatigue and just concentrate on conquering the trail against which they are battling.

* Completed model for reference purposes

Photograph Specifications
Frame Size:420mm Wheels: SHIMANO XT WH-M785 Tires:BRIDGESTONE EXTENZA TUBELESS Color: Racing Red

SPEC

Model	XN7 FRAME
Frame Size	420, 460mm
Frame	Neo-Cot Cr-Mo Professional
Headset	TANGE LAV-82 Ahead
Seat Pin	Quick type
Accessories	LED lamp, bell, reflector, Allen key, valve adapter, manual pack
Frame Weights	Frame only 1,770g (420mm)
Racing Color	Racing yellow, Racing orange, Racing lime, Racing sky-blue, Racing blue, Racing pink, Racing black, Racing silver, Racing dark silver, Racing gold, Racing red

Racing Color
11color

NEW HUMAN GEOMETRY

NEO-COT Cr-Mo PROFESSIONAL

ALUMINIUM MTB
XA3 FRAME

エントリーライダー必携のアルミモデル
Aluminum model indispensable for entry riders

The X3, which provides support for MTB riders making their debuts, uses an aluminum frame for which the emphasis has been placed on durability and a direct riding sense. The tubes have been formed with the semi-hydro foaming method, which does not require gusset welding to supplement strength, and that contributes to both strength and lightness. We aimed at achieving mild comfort by reducing the outer diameter of the bend-processed seat stay to combat the jolts from road surfaces that cannot be avoided when riding on dirt. Everything that an entry rider needs to improve performance has been crammed into this bike, and we hope they will enjoy the fun of streaking along over dirt surfaces.

* Completed model for reference purposes

Photograph Specifications
Frame Size:420mm Wheels: SHIMANO WH-MT15 Tires:BRIDGESTONE Color: Racing Red

SPEC

Model	XA3 FRAME
Frame Size	420, 460mm
Frame	Aluminum semi-hydro forming, butted tube, no Chianti pedestal
Headset	TANGE ZERO STACK ZS22LT integral head, press-in-type, cartridge-type
Seat Pin	ϕ31.8 band quick type
Accessories	LED lamp, bell, reflector, Allen key, valve adapter, manual pack
Frame Weights	Frame only 1,620g (420mm)
Racing Color	Racing red, Racing black, Racing lime, Racing sky-blue, Racing silver

Racing Color
5color

FRAME GEOMETRIES

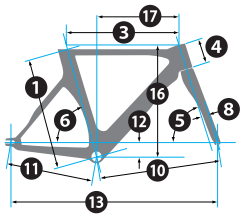
TRACK

Model			Frame Size Center to Top ❶	Top Tube Length (Estimated when horizontal) ❸	Head Tube Length ❹	Head Angle ❺	Seat Angle ❻	Offset ❽	Front Center ❿	Rear Center ⓫	BB Drop ⓬	Wheelbase ⓭	Stack ⓰	Reach ⓱
Carbon	TS9 FRAME	S	475	524	90	73°00'	75°00'	38	569	398	50	961	475	397
		M	505	534	120	73°15'	74°30'	38	573	398	50	966	504	395
		L	535	555	145	73°30'	74°00'	38	587	398	50	979	529	403
	TM9 FRAME	S	486	524	90	73°00'	75°00'	38	567	402	60	961	485	394
		M	516	534	120	73°15'	74°30'	38	571	402	60	966	514	392
		L	546	555	145	73°30'	74°00'	38	585	402	60	979	539	400

Suitable Frame Sizes Calculated from Leg Lengths

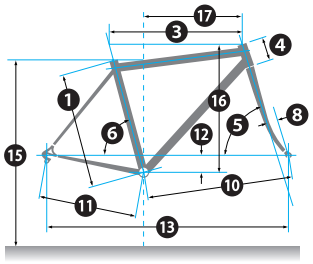
Relevant Model: TRACK

Size	Top Length	Suitable Height	Leg Length 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86
S	524	161-172	
M	534	167-178	
L	555	174-185	



ROAD

Model		Frame Size Center to Top ❶	Top Tube Length (Estimated when horizontal) ❸	Head Tube Length ❹	Head Angle ❺	Seat Angle ❻	Offset ❽	Front Center ❿	Rear Center ⓫	BB Drop ⓬	Wheelbase ⓭	Standard Over-height (above-ground) ⓯	Stack ⓰	Reach ⓱
Carbon	RS9 FRAME	430	505	100	71°00'	75°00'	50	576	405	68	971	679	497	372
		460	520	110	72°00'	74°30'	50	579	405	68	974	705	510	379
		490	535	120	72°30'	74°15'	48	585	405	70	980	729	524	387
		520	550	140	73°00'	73°45'	45	588	410	70	987	757	546	391
		550	565	160	73°00'	73°00'	45	595	410	70	995	783	565	392
	RL8 FRAME	390	490	100	70° 30'	75° 45'	55	578	415	65	984	649	491	365
		420	505	110	71° 00'	75° 15'	50	575	405	65	971	672	504	372
		450	520	120	72° 00'	74° 45'	50	582	405	65	978	700	517	379
		480	535	130	72° 30'	74° 15'	48	585	408	68	983	724	532	385
		510	550	150	73° 00'	73° 45'	45	589	408	68	986	753	553	389
		540	565	170	73° 00'	73° 00'	45	595	410	68	996	779	572	390
Neo-Cot Professional	RN7 FRAME	490	516	83	72°00'	74°45'	50	577	405	65	973	735	486	383
		510	524	94	72°00'	74°30'	50	583	405	65	979	751	496	386
		520	529	99	72°00'	74°30'	50	587	405	70	982	756	506	389
		530	534	106	72°30'	74°15'	48	584	405	70	979	765	515	389
		540	539	115	72°30'	74°15'	48	589	405	70	984	774	523	391
		550	550	122	73°00'	74°00'	45	590	410	70	990	783	533	397
		570	565	138	73°30'	73°45'	45	598	410	70	998	801	551	404
		590	575	157	73°30'	73°30'	45	605	410	70	1005	819	570	406
Neo-Cot Standard	RN3 FRAME	490	510	80	71°30'	75°15'	50	580	410	65	981	740	487	382
		510	518	83	72°00'	75°00'	50	581	410	70	980	752	496	385
		530	528	104	72°00'	74°45'	50	589	410	70	989	771	516	388
		550	539	119	73°00'	74°30'	45	584	410	70	984	790	534	391
		570	551	138	73°00'	74°15'	45	594	410	70	994	808	553	395
Hybrid	RC6 FRAME	460S	505	100	71°00'	75°00'	50	577	405	68	972	704	497	372
		460	520	110	72°00'	74°30'	50	579	405	68	974	706	510	379
		490	535	120	72°30'	74°15'	48	585	410	70	985	730	524	387
		520	550	140	73°00'	73°45'	45	588	410	70	987	757	546	391
		550	565	160	73°00'	73°00'	45	595	410	70	994	783	565	392



Suitable Frame Sizes Calculated from Leg Lengths

Relevant Model: RS9 FRAME

Sloping Frame Size	Top Tube Length	Suitable Height	Leg Length 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86
430	505	145-160	
460	520	158-170	
490	535	165-176	
520	550	172-183	
550	565	179-188	

Relevant Model: RL8 FRAME

Sloping Frame Size	Top Tube Length	Suitable Height	Leg Length 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86
390	490	140-156	
420	505	149-160	
450	520	156-169	
480	535	162-176	
510	550	169-182	
540	565	176-187	

Relevant Model: RN7 FRAME

Frame Size	Top Tube Length	Suitable Height	Leg Length 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86
490	516	158-164	
510	524	162-169	
520	529	164-173	
530	534	167-176	
540	539	171-178	
550	550	173-180	
570	565	178-185	
590	575	182-189	

Relevant Model: RN3 FRAME

Sloping Frame Size	Top Tube Length	Suitable Height	Leg Length 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86
490	510	158-164	
510	518	162-169	
530	528	167-176	
550	539	173-180	
570	551	178-185	

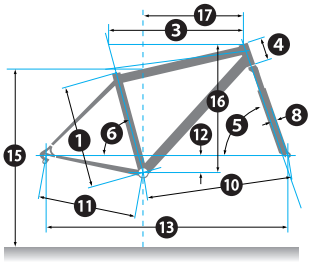
Relevant Model: RC6 FRAME

Sloping Frame Size	Top Tube Length	Suitable Height	Leg Length 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86
460S	505	150-160	
460	520	158-169	
490	535	164-176	
520	550	171-182	
550	565	178-187	

FRAME GEOMETRIES

MTB

Model		Suspension Value	Frame Size Center to Top ❶	Top Tube Length (Estimated when horizontal) ❸	Head Tube Length ❹	Head Angle ❺	Seat Angle ❻	Offset ❽	Front Center ❿	Rear Center ⓫	BB Drop ⓬	Wheelbase ⓭	Standard Over-height (above-ground) ⓯	Stack ⓰	Reach ⓱
Carbon	XS9 FRAME	Estimated at 100mm	380	550	120	71°00'	73°30'	39	609	420	30	1027	669	570	381
			440	575	120	71°00'	73°00'	39	629	420	30	1042	719	570	401
			500	600	120	71°00'	73°00	39	654	420	30	1072	765	570	426
Man-Cut Professional	XN7 FRAME	Estimated at 100mm	420	577	100	68°30'	71°30'	39	643	425	16	1067	714	524	402
			460	588	100	69°00'	71°30'	39	648	425	16	1073	746	526	412
Aluminium	XA3 FRAME		380	549	110	70°00'	73°30'	39	617	420	30	1035	683	549	382
			420	567	110	71°00'	73°30'	39	625	420	30	1043	720	553	399
			460	581	110	71°00'	73°30'	39	639	420	30	1057	751	553	413



Suitable Height

Calculated from leg length and frame size, and the length of the longest line from the head to the seat

Relevant Model: XS9

Frame Size	Top Tube Length	Suitable Height	Leg Length 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86
380	550	144-158	
440	575	157-172	
500	600	171-186	

Relevant Model: XN7 FRAME

Frame Size	Top Tube Length	Suitable Height	Leg Length 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86
420	577	160-173	
460	588	169-182	

Relevant Model: XA3 FRAME

Frame Size	Top Tube Length	Suitable Height	Leg Length 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86
380	549	151-169	
420	567	160-178	
460	581	167-185	

Method of Measuring Leg Length

* The use of a gauge for measuring leg length is recommended.