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TECHNICAL INFORMATION

BICYCLE TIRES



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What do the various size markings on bicycle tires mean?

ETRTO

Nowadays, bicycle tires sizes should all fall in line with **ETRTO's** (European Tire and Rim Technical Organization) tire and rim standards. Yet the older English and French tire size markings are still used.

An **ETRTO** size marked 37-622 indicates the width of 37 mm and the tire inner diameter of 622 mm. This designation is clear and allows an unequivocal match with the corresponding rim size.

Inch/Imperial sizes

Inch size designations are less accurate. A tire marked 28 x 1 ⁵/₈ x 1 ³/₈ indicates an approximate outer diameter of 28 inch, the tire section height of 1 ⁵/₈-inch, and the tire section width of 1 ³/₈-inch. Inch sizes can also follow the pattern 26 x 2.10, which, in this case indicates only tire's outer diameter and the tire's section width.

Inch sizes are ambiguous and lack accuracy. For example, the diameters 559 mm (MTB), 571 mm (Triathlon) and 590 mm (Touring) are all designated 26 inch. Tires with diameters 622 mm and 635 mm are both designated 28-inch, yet, surprisingly, tires with a diameter of 630 mm are designated 27-inch.

French size markings

A **French size marked** 700 x 35C, indicates the approximate tire outer diameter of 700 mm and the tire section width of 35 mm. Not all tire sizes exist as French size designations, for instance MTB sizes.



Size designations on the tire

Designations Overview

	ETRTO	Inch	French
Size designation	37-622	28 x 1 ⁵ / ₈ x 1 ³ / ₈	700 x 35C
Outer diameter	-	Approx. 28 Zoll	Approx. 700 mm
Inner diameter	622 mm	-	-
Tire section width	Approx. 37 mm	Approx. 1 ³ / ₈ Zoll	Approx. 35 mm
Tire section height	-	Approx. 1 ⁵ / ₈ Zoll	-

How many tire sizes are there?

The following table shows all common tire sizes.

This table lists, where applicable, a corresponding ETRTO-size for virtually every tire size.

	ETRTO	Inch	French		ETRTO	Inch	French		ETRTO	Inch	French
7"	47-93	7 x 1 1/4		20"	54-406	20 x 2.00		26"	57-559	26 x 2.20/2.25	
8"	47-94	20 x 47-50 8 x 2			57-406	20 x 2.125			60-559	26 x 2.35	
	50-94	200 x 50			54-428	20 x 2.00			62-559	26 x 2.50	
	54-110	8 1/2 x 2 1/8 8 1/2 x 2			40-432	20 x 1 1/2			20-571	26 x 3/4	650 x 20C
	32-137	8 x 1 1/4			37-438	20 x 1 3/8	500A		23-571	26 x 7/8	650 x 22C
10"	54-152	10 x 2			40-438	20 x 1 3/8 x 1 1/2	500 x 38A		40-571	26 x 1 1/8 CS 26 x 1 1/8 x 1 1/2 NL 26 x 1 1/8 x 1 1/2	650 x 35C 650 x 38C
	44-194	10 x 1 3/8			28-440		500 x 28A 500A 500A Standard		47-571	26 x 1 1/4 650 CS Confort	650 x 45C
11"	47-222	11 x 1 3/4			37-440		500 x 35A 500A Confort 500A Ballon 500A 1/2 Ballon		54-571	26 x 2 x 1 1/4	650 x 50C
12"	47-203	12 1/2 x 1.75 12 1/2 x 1.90			40-440	20 x 1 1/2 NL	500 x 38A		28-584	26 x 1 1/8 x 1 1/2	650 x 28B
	54-203	12 x 1.95			28-451	20 x 1 1/8			32-584		650 x 32B
	57-203	12 1/2 x 2 1/4 R			37-451	20 x 1 3/8 B.S.			35-584	26 x 1 3/8 x 1 1/2	650 x 35B 650B Standard
	62-203	12 1/2 x 2 1/4			44-484	22 x 1 3/8 x 1 1/2			37-584	26 x 1 1/2 x 1 3/8 26 x 1 1/2	650 x 35B
32-239	12 1/2 x 1 3/8 x 1 1/4	300 x 32A	22"	25-489	22 x 1.00		40-584	26 x 1 3/8 x 1 1/2 26 x 1 1/2	650 x 35B 650 x 38B		
57-239	12 1/2 x 2 1/4	300 x 55A		37-489	22 x 1 3/8 NL		44-584	26 x 1 3/8 x 1 1/2	650 x 42B 650B Semi-Confort 650B 1/2 Ballon		
14"	57-251	14 1/2 x 2 1/4		300 x 55A	40-489	22 x 1 3/8 x 1 1/2		20-590		650 x 20A	
	47-254	14 x 1.75 14 x 1.90			50-489	22 x 2.00		25-590	26 x 1 1/8, 1 1/4 26 x 1 3/8 x 1 1/8 - 1 1/4	650 x 25A	
	40-279	14 x 1 1/2		350 x 38B	28-490		550 x 28A 550A 550A Standard	28-590	26 x 1 1/8	650 x 28A	
	37-288	14 x 1 3/8 x 1 3/8		350A 350A 350A Confort 350A Ballon 350A 1/2 Ballon 350 x 32A	32-490	22 x 1 3/8 x 1 1/4	550 x 32A 550A	32-590	26 x 1 1/4 26 x 1 3/8 x 1 1/4	650 x 32A	
40-288	14 x 1 3/8	350 x 38A		37-490	22 x 1 3/8	550 x 35A 550A Confort 550A Ballon 550A 1/2 Ballon	35-590	26 x 1 3/8	650 x 35A		
44-288	14 x 1 3/8 x 1 3/8	350A 350 x 42A		37-498	22 x 1 3/8 x 1 1/4		37-590	26 x 1 3/8	650 x 35A 650A		
32-298	14 x 1 1/4	350A 350 x 32A		32-501	22 x 1 1/4		40-590	26 x 1.50 26 x 1 3/8 x 1 1/2	650 x 38A		
16"	40-305	16 x 1.50			37-501	22 x 1 3/8		44-590			
	47-305	16 x 1.75 16 x 1.90			40-507	24 x 1.50		32-597	26 x 1 1/4		
	54-305	16 x 1.95 16 x 2.00			44-507	24 x 1.625 24 x 1.75		27-609	27 x 1 1/2		
	57-305	16 x 2.125		47-507	24 x 1.75		20-630	27 x 3/4			
	40-330	16 x 1 1/2	400 x 38B	49-507	24 x 1.85		22-630	27 x 7/8			
	28-340		400 x 30A	50-507	24 x 1.90/2.00 24 x 2.00 24 x 2.125		25-630	27 x 1.00 27 x 1 1/16			
	32-340	16 x 1 3/8 x 1 1/4	400A 400 x 32A	54-507	24 x 2.10		28-630	27 x 1 1/8 27 x 1 1/4 27 x 1 1/4 27 x 1 1/4			
	37-340	16 x 1 3/8	400 x 35A 400A Confort 400A Ballon 400A 1/2 Ballon	57-507	24 x 2.125 24 x 2.00		32-630	27 x 1 1/4			
	44-340	16 x 1 3/8		60-507	24 x 2.35		28/32-630	27 x 1 1/4			
	28-349	16 x 1 3/8		44-531	24 x 1 3/8 x 1 1/2		35-630	27 x 1 3/8			
	32-349	16 x 1 1/4 NL		40-534	24 x 1 1/2		27"	18-622	28 x 3/4	700 x 18C	
	37-349	16 x 1 3/8		25-540	24 x 1.00			19-622		700 x 19C	
17"	32-357	17 x 1 1/4		32-540	24 x 1 3/8 x 1 1/4 24 x 1 3/8			20-622	28 x 3/4	700 x 20C	
	32-369	17 x 1 1/4		37-540	24 x 1 3/8			22-622	28 x 7/8	700 x 22C	
18"	28-355	18 x 1 3/8		40-540	24 x 1 3/8 x 1 1/2			23-622	28 x 7/8	700 x 23C	
	40-355	18 x 1.50		22-541		600 x 25A		25-622	28 x 1.00, 1 1/16	700 x 25C	
	47-355	18 x 1.75 18 x 1.90		28-541		600 x 28A 600A 600A Standard		30-622	28 x 1.20	700 x 28C	
	37-387	18 x 1 3/8		32-541	24 x 1 3/8 x 1 1/4 N4	600 x 32A		28-622	28 x 1 3/8 x 1 1/8	700 x 30C	
	40-387	18 x 1 1/2		37-541		600 x 35A 600A Confort 600A Ballon 600A 1/2 Ballon		32-622	28 x 1 3/8 x 1 1/4	700 x 32C 700C COURSE	
	28-390	18 x 1 3/8	450 x 28A 450A	26"	25-559	26 x 1.00			35-622	28 x 1 3/8 x 1 3/8	700 x 35C
	37-390	18 x 1 3/8	450 x 35A 450A 450A Confort 450A Ballon 450A 1/2 Ballon		35-559	26 x 1.35			37-622	28 x 1 3/8 x 1 3/8	700 x 35C
	55-390		450 x 55A		37-559	26 x 1 3/8 x 1 3/8 26 x 1.40			40-622	28 x 1.50 28 x 1 3/8 x 1 1/2	700 x 38C
	57-390		450 x 55A 450A		40-559	26 x 1.50		42-622	28 x 1.60	700 x 40C	
	37-400	18 x 1 3/8			44-559	26 x 1.625 26 x 1.50/1.75		44-622	28 x 1.625	700 x 42C	
	20"	54-400	20 x 2 x 1 1/4 20 x 2 F 4J			47-559	26 x 1.75 26 x 1.85/1.90		47-622	28 x 1.75	700 x 45C
		28-406	20 x 1 3/8			50-559	26 x 1.90 26 x 1.95 26 x 1.90/2.00 26 x 2.00/2.10		50-622	28 x 1.90 28 x 2.00	
32-406		20 x 1.25			54-559	26 x 1.95 26 x 2.10 26 x 2.125		60-622	28 x 2.35		
35-406		20 x 1.35			57-559	26 x 2.125		32-635	28 x 1 1/2 x 1 1/8	770 x 28B 700 x 28B 770B COURSE	
37-406		20 x 1 3/8						40-635	28 x 1 1/2 28 x 1 1/2 x 1 3/8	700 x 38B 700 x 35B 700 Standard 700B Standard	
40-406		20 x 1.50						44-635	28 x 1 3/8 x 1 1/2	700 x 40/42B	
44-406		20 x 1.625						28-642	28 x 1 3/8 x 1 1/8	700 x 28A	
47-406		20 x 1.75					37-642	28 x 1 3/8	700 x 35A		
50-406		20 x 2.00									

Tire circumference

What is the exact circumference of my tire?

In order to accurately program a bicycle computer it is generally necessary to enter the exact tire circumference.

The tire circumference varies depending on the rim, the tire pressure and the load on the tire. For these reasons, it is not possible to list exact tire circumferences.

In order to accurately program a bicycle computer, we recommend a simple rolling test with the rider on the bicycle.

The approximate tire circumferences for the most common sizes are listed in the table on the right: Inch ETRTO Approximate tire circumference

Inch	ETRTO	Approx. Tire Circumference
20"	40-406	1530 mm
	47-406	1550 mm
	54-406	1590 mm
24"	47-507	1860 mm
	54-507	1920 mm
26"	25-559	1940 mm
	35-559	1980 mm
	40-559	2000 mm
	47-559	2020 mm
	50-559	2040 mm
	54-559	2080 mm
	57-559	2100 mm
	60-559	2150 mm
	37-590	2090 mm
	28"	20-622
23-622		2120 mm
25-622		2130 mm
28-622		2150 mm
32-622		2160 mm
37-622		2190 mm
40-622		2220 mm
47-622		2280 mm
50-622		2280 mm
60-622		2350 mm
32-630		2180 mm
40-635		2240 mm

Actual width
Standard width

Why is it that tires are often actually narrower than the ETRTO tire section width?

The width standard of a tire is established on quite wide, standard rims. Yet in practice, rims that are in general use are narrower than standard and, in turn, this leads to tires becoming slightly narrower.

In order to ensure that tires have sufficient frame clearance, tire manufacturers generally prefer to keep production closer to the lower end of the permitted tolerance (+/- 3mm).

As carcass materials have improved greatly over recent years, it means that carcasses stretch less after fitment. In order to correct this phenomenon, over the past few years we have used slightly wider carcasses, so that the actual widths are now much closer to the standard widths.

Will the tire fit my frame?

Fit dimensions

Maximum width

Maximum diameter

The question whether the tires will fit into a particular frame is often asked in relation to our ultra-wide tires.

It is easy to appreciate that with the large number of different bicycle models we are unable to check the compatibility of all frames and tires.

So, the following list shows the exact diameters and widths of our ultra-wide tires. This should allow verification that there is sufficient frame clearance for fitment of the selected tire.



A = Maximum width

B = Maximum diameter

C = Diameter at maximum width

	Fat Albert 60-559	King Jim 60-559	Big Jim 57-559	Fast Fred 60-559	Big Apple 60-559	Big Apple 50-559	Big Apple 60-622	Big Apple 50-622
Maximum width	59	60	55	59	60	47	60	49
Maximum diameter	688	681	675	678	683	661	745	727
Diameter at maximum width	664	653	648	648	616	610	678	676

Which tire fits which rim?

Tire/
Rim combinations

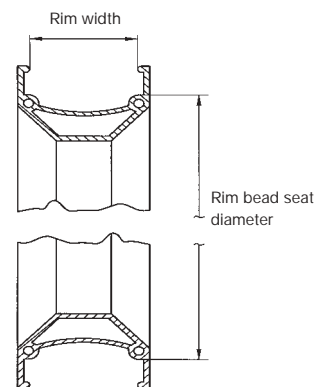
Rim dimensions

Rim bead seat diameter

Rim width

The inner diameter of the tire must match the rim bead seat diameter. For instance a tire size 37-622 fits on a 622 x 19C rim. The inner diameter of the tire corresponds to the rim bead seat diameter of 622 mm.

Furthermore, the tire section width must match the rim width. The following table shows possible combinations of tire section widths with rim widths according to ETRTO.



Tire section width (mm)	Rim width (mm)															
	18	20	23	25	28	32	35	37	40	44	47	50	54	57	60	
13C	X	X	X	X												
15C			X	X	X	X										
17C				X	X	X	X	X								
19C					X	X	X	X	X	X	X					
21C							X	X	X	X	X	X				
23C									X	X	X	X				
25C										X	X	X	X	X	X	X

Wide tires
Narrow rims

Can I use a narrower rim?

Wide tires are often fitted on narrower rims, as with Mountain Bikes, and also our BIG-APPLE tire. This saves weight, but it is also because very few wide rims are actually available in the market.

The rim manufacturer should be consulted before such fitment and only if they judge it safe. In order to prevent excessive stress on the rim, we advise not to inflate the tire to maximum pressure.

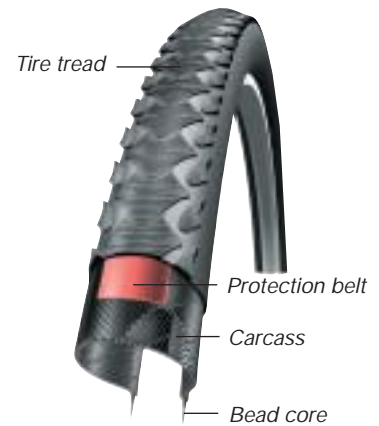
As a general guide, MTB tires of say 54 mm width fitted on standard 17C and 19C rims should not be inflated to more than 4 BAR. Very wide tires of ca. 60mm fitted on narrow rims should not be inflated to more than 3 BAR. Under no circumstances should rims of less than 17 mm be used.

Tire width	Rim according to ETRTO	Recommended max. pressure with narrow rims (17C/19C)
50 mm	21C-25C	4,0 bar
54 mm	25C	4,0 bar
57 mm	25C	3,5 bar
60 mm	25C	3,0 bar

What is a tire made of?

There are three basic parts to a bicycle tire, the carcass, the bead core and the rubber tire tread. Furthermore, almost all SCHWALBE-tires have a puncture protection belt.

The carcass is a rubberized textile fabric, which is laid around the bead cores. The carcass is then coated with a rubber compound. The tire tread is applied and the whole assembly is vulcanized.



Bead core

The bead core of the tire determines its diameter and ensures a secure fit on the rim. Generally the **bead core** of a tire is made of steel wire.

Wire core Kevlar core

In folding tires, the steel wire is replaced with a hoop of **Kevlar fiber**. The advantage is that the tire can be folded and that, depending on the size, its weight can be reduced by 50 to 90 g.



Wire bead core



Kevlar bead core

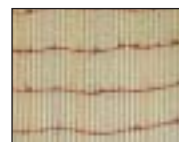
Carcass

EPI

TPI

All SCHWALBE carcasses are made of nylon. The density of the carcass fabric is expressed in EPI or TPI (Ends Per Inch, Threads Per Inch). The range of carcasses used for SCHWALBE tires are 24, 37, 50, 67 and 120 EPI.

Generally, tires with denser fabric are more resistant to punctures and roll better. Yet the ultra-fine 120 EPI carcass is more susceptible because the individual filaments are very fine. The best compromise for low weight and resistance is around 50 to 67 EPI.



Low density carcass



High density carcass

Rubber Compound

The rubber compound of a tire is composed of several components:

- Natural and synthetic rubber
- Fillers, e.g. carbon black, chalk, silica
- Softeners, e.g. oils and greases
- Anti-ageing agents (aromatic amines)
- Vulcanizing aids, e.g. sulphur
- Vulcanization accelerators; e.g. zinc oxide
- Pigments and dyes



Natural rubber



Synthetic rubber

Depending on the compound, the composition is roughly 40 – 60 % rubber, 15 – 30 % fillers, with the other components accounting for the rest.

Puncture protection belt

Almost all SCHWALBE tires have a puncture protection belt, though we purposely decided not to include them in the special light and sports tires.

Even our standard tires are equipped with an effective puncture protection belt made of natural rubber (**Puncture protection**). MARATHON-tires, with the proven combination of natural rubber and Kevlar fibers in

Puncture protection belt

the **Kevlar®-MB-Belt** ensures remarkably high puncture protection. Furthermore, our top of the range tires have highly efficient puncture protection systems which are specifically adapted to the particular requirements, for example **Double-Defense®** or **SmartGuard®**.

Which is the best puncture protection belt?

The current state of the art is our **SmartGuard®**, the safest puncture protection belt on the market.

Other puncture protection systems like **Double-Defense®** or **Kevlar®-MB-Belts** provide a very high degree of puncture protection. The decisive advantage of the **SmartGuard®** is its effectiveness against objects that become embedded in the tread, that are rolled over at each turn of the wheel and will eventually perforate virtually any protection belt. When this happens, the thickness of the **SmartGuard®** proves its advantage as a drawing pin will simply remain stuck in the rubber without further harming the tire.



Marathon with Kevlar®-MB-Belt



SmartGuard®-Protection belt

Which is the best rubber compound?

A rubber compound must satisfy various requirements that are to some extent contradictory: low rolling resistance, good slip resistance, low wear, longevity, solid lugs (MTB).

The conflicting aims of low rolling resistance and good wet grip always attract particular attention. Good grip implies that the tire must "absorb" a lot of energy while low rolling resistance requires a tire compound with low energy consumption. A good compromise can be achieved with a filling agent like Silica, but another solution is the use of several rubber compounds in one tire such as Dual Compound Technology.

We offer universal compounds that, as far as possible, combine all relevant features, as well as special compounds where one feature is particularly prominent. The **MARATHON 23S** compound of is one of our universal compounds, while on the other hand the **Marathon XR 1A** compound is used to achieve very high mileage performance. Another example is the **Maximum Grip Compound** of the **STELVIO RAIN**.

Rubber Compound

SILICA

Clincher tire

What is a clincher tire?

These days clincher tires are the standard for bicycle tires (see tire construction). The wire tire bead prevents the tire from expanding with the pressure and thus from rolling off the rim.

Folding tire

What is a folding tire?

A folding tire is, in a way, a special version of the clincher tire (see tire construction, bead core). In this tire, the wire is replaced with a bundle of Kevlar fibers that allows it to fold easily and also makes the tire lighter by about 50 – 90 g.



Marathon XR as a Folding Tire

Tubular

What is a Tubular?

In a Tubular, the tube is sewn directly into the tire. The tire is then glued onto a special rim.

Many pros still swear by them, claiming that they provide a better “feel” and that the tires have more “life”, i.e. better comfort and smoother cornering. At least with regard to rolling resistance, this is now very much an outdated idea as modern folding tires have certainly caught up with tubulars in terms of rolling resistance with some, as is the case with the STELVIO LIGHT, even exceeding tubular performance.



Stelvio Tubular

The unquestioned advantage of tubulars lies with their puncture stability, as even in the case of a catastrophic puncture, the tire stays on the rim. The rider can safely stop without losing control of the bicycle, or even slowly ride on until the team car arrives.

The drawback of tubulars is in fitting. The fixing of the tire onto the rim with glue is much more awkward than fitting a clincher tire. Furthermore, in the case of a defect, the tubular cannot be repaired easily like a tube as the complete tire has to be replaced. The manufacturing process is also more labor intensive, which explains the high cost of top quality tubulars.

Tubeless
UST

What is a tubeless tire?

As the name implies the tubeless system needs no tube. The tire and the rim are made in such a way that fitting them together provides an airtight seal. So special tires and rims are necessary and at the moment tubeless tires are only available for mountain bikes. The Mavic UST (Universal System Tubeless), which was introduced in 1999 has become, to all intents and purposes, market standard.

The advantage of tubeless tires is that there is no sudden loss of pressure in case of a puncture. The perforating object either remains in the tire, sometimes even sealing itself, or it is dislodged and the air escapes very gradually. It also provides better impact resistance and valve tear off due to the tire slipping on the rim is impossible.

It is important to note that fitting requires more effort and is significantly different from the fitting of traditional tires, so the fitting instructions must be followed closely (see section on fitment). The tire and the rim must be perfectly clean, especially in the contact area, in order to have an airtight seal.

A puncture can be repaired from the inside with a traditional repair patch. But because the hole can often be hard to find, it is recommendable to insert a standard tube to repair a roadside puncture. In order to fit a tube, the valve first has to be removed from the rim.



*Tubeless-System:
Airtight seal of the tire and
the valve.*

What does the tread do?

Tread

On a normal, smooth road, the tread has only limited influence on the ride properties. The grip generated by the tire on the road is almost exclusively the result of the rubber compound.

Aquaplaning

Aquaplaning Unlike a car, a bicycle will not aquaplane as the contact area is so much smaller and the contact pressure is much higher. The floating effect of aquaplaning could only theoretically be achieved on a bicycle ridden at speeds over 200 km/h.

Off road, the tread is very important. In this situation the tread establishes an interlocking cog-like connection with the ground and enables the transmission of all driving, braking and steering forces.

On rough roads, the tread can also contribute to better control.



Black Jack, profiled MTB tire

Why ride a slick tire?

Slick

Even in wet conditions, on a normal, smooth road, a slick tire actually provides better grip than a tire with a tread, because the contact area is larger.

The situation is much different on a rough road and even worse on a dirt trail as in these cases the degree of control provided by a slick tire is extremely limited.

A slightly serrated surface on the tire tread can have a positive effect on tire grip, as it creates micro interlocking with rough asphalt.



Marathon Slick

Rolling direction
arrows

What do the direction arrows mean?

Most SCHWALBE tire sidewalls are marked with a "Drive" arrow, which indicates the recommended rolling direction. When in use, the tire should run in the direction of the arrow.

Many MTB tires are marked with a "Front" and a "Rear" arrow. The "Front" arrow indicates the recommended rolling direction for the front wheel and respectively the "Rear" arrow is the direction for the rear wheel.



Why are there so many tires with direction arrows?

In road tires, a tread with a rolling direction generally provides a slight reduction in rolling resistance. In addition to this, aesthetic considerations can also be important.

Off road, rolling direction is far more important, as the tread ensures optimum connection between the tire and the ground. The rear wheel transmits the driving force and the front wheel transmits the braking and steering forces. Driving and braking forces operate in different directions so this is why certain tires are fitted in opposite rolling directions when used as front and rear tires. There are also treads without a specified rolling direction.

Rolling direction



*Marathon cross,
Trekking tread with
rolling direction.*

What exactly is rolling resistance?

Rolling resistance

Rolling resistance is the energy that is lost when the tire is rolling and the main reason for loss of energy is the constant deformation of the tire.

In addition to rolling resistance, there are also other resistances that have to be overcome when riding a bicycle.

Air resistance

Air resistance rises squared with increased speed. At a straight-line speed of 20 km/h on the flat, air resistance is the main resistance force.

Speed

Acceleration Energy is also required to accelerate. For instance, the weight of the wheels is of great importance when this mass has to be brought up to rotation.

Gradient resistance

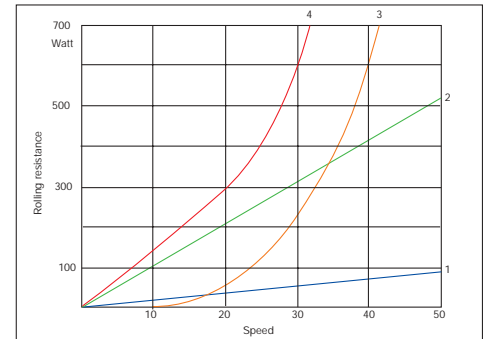
When riding uphill, the main resisting force to overcome is the gradient resistance (descending force).

Friction resistance

In addition to these, there are other friction resistances in the chain and all of the other moving parts. Yet in a well-serviced bicycle, these represent a very minor part of the total resistance.

Resistance force on a bicycle

- 1 Rolling resistance
- 2 Gradient resistance
- 3 Air resistance
- 4 Total resistance (1 + 2 + 3)



Which factors affect rolling resistance?

Tire pressure

Tire pressure, tire diameter, tire construction, tire tread and other factors all have an effect on rolling resistance.

The higher the tire pressure, the less is tire deformation and thus the rolling resistance.

Tire diameter

Small diameter tires have a higher rolling resistance at the same tire pressure, because tire deformation is proportionally more important, in other words the tire is "less round".

Tire section width

Wider tires roll better than narrow ones. This assertion generally generates skepticism, nevertheless at the same tire pressure a narrow tire deflects more and so deforms more.

Tire construction

Obviously, tire construction also has an effect on rolling resistance. The less material is used, the less material there is to deform. And the more flexible the material is, such as the rubber compound, the less energy is lost through deformation.

Tire tread

Generally, smooth treads roll better than coarse treads. Tall lugs and wide gaps usually have a detrimental effect on rolling resistance.

Contact area
Flat area

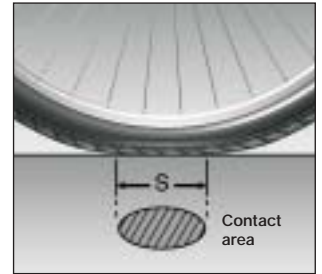
Why do wide tires roll better than narrow ones?

The answer to this question lies in tire deflection. Each tire is flattened a little under load. This creates a flat contact area.

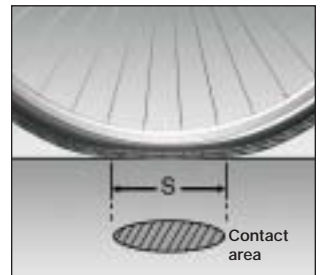
At the same tire pressure, a wide and a narrow tire have the same contact area. A wide tire is flattened over its width whereas a narrow tire has a slimmer but longer contact area.

The flattened area can be considered as a counterweight to tire rotation. Because of the longer flattened area of the narrow tire, the wheel loses more of its "roundness" and produces more deformation during rotation. However, in the wide tire, the radial length of the flattened area is shorter, making the tire "rounder" and so it rolls better.

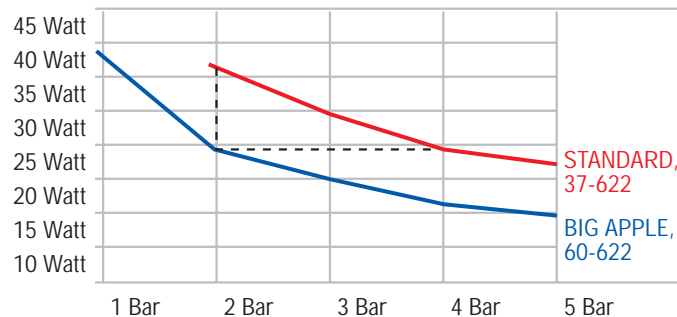
Rolling resistance as a function of the tire width



Wide tires



Narrow tires



Rolling resistance:

At 2 bar a 60mm wide tire rolls as well as a 37 mm tire at 4 bar.

Why do Pros ride narrow tires if wide tires roll better?

Wide tires only roll better at the same inflation pressure, but narrow tires can be inflated to higher pressures than wide tires. However, they then obviously give a less comfortable ride.

In addition to this, narrow tires have an advantage over wide ones at higher speeds, as they provide less air resistance.

Above all, a bicycle with narrow tires is much easier to accelerate because the rotating mass of the wheels is lower and the bicycle is much more agile.

At constant speeds of around 20 km/h, the ride is better with wider tires. In practice, the energy saving is even greater than in theory as the elasticity of the tires absorbs road shocks, which would otherwise be transferred to the rider and so saves energy.

Comparison of rolling resistance

Which SCHWALBE tire has the lowest rolling resistance?

The rolling resistance of a tire should not be overestimated, as it is only a part of the total resistance. In addition, the correct inflation pressure has a much greater influence on rolling resistance than the tire structure.

In order to make a tire with very low rolling resistance, it is necessary to compromise on other important factors such as puncture protection or grip.

The following gives a rough overview of tires and their relative rolling resistance. A direct comparison is impossible though, as the tires have different widths and some are used with very different inflation pressures.

	Low rolling resistance	High rolling resistance
Touring tires	MARATHON SLICK MARATHON MARATHON CROSS MARATHON PLUS BIG APPLE MARATHON XR CRUISER	
Racing tires	STELVIO LIGHT STELVIO EVOLUTION STELVIO STELVIO RAIN BLIZZARD BLIZZARD SPORT	
MTB tires (by tread pattern)	FAST FRED HURRICANE BLACK JACK ALBERT BROTHERS JAMES GANG BLACK SHARK MUD	
MTB tires (by construction)	TUBELESS LIGHT DOUBLE DEFENSE FOR QUALITY PUNCTURE PROTECTION	

When is a tire worn out?

Tread

In bicycle tires the tread is far less important than for instance in car tires. So using a tire with a worn out tread is less of a problem, that is of course with the exception of MTB tires.

Wear limit

When the puncture protection belt or the carcass threads can be seen through the tread the tire has reached its wear limit and must be replaced. As the puncture resistance also depends on the thickness of the tread layer it may be useful to replace the tire earlier.

Sidewall

Inflation pressure

The sidewalls of tires often fail before the tread is worn out. In most cases, this premature failure is due to prolonged use of the tire with insufficient inflation pressure. Checking and adjusting the inflation pressure at least once a month with a pressure gauge is most important.

What mileage can be achieved by the various tires?

Mileage

It is difficult to answer this question, as tire mileage is influenced greatly by tire pressure, load, road surface, temperature and the rider. For example, when used in hot weather with a heavy load and on rough asphalt, a tire wears much faster.

As a general guide, you should expect a tire life of 2000 to 5000 km from SCHWALBE standard tires. Marathon type tires should generally last for 6000 to 12000 km. The MARATHON XR is an exception with its high mileage of about 8000 to 15000 km. With MTB tires, it is impossible to give a useful indication, as the individual riding style is the main determining wear factor. The Stelvio Competition tire should generally last 3000 to 7000 km.

How long can a tire be stored?

Storage

SCHWALBE tires can be stored for up to 5 years without problem, but to attain this they should be stored in a cool, dry, and, most importantly, dark place. When stored properly, even longer storage times may be possible.

If fitted on a rim, tires should always be inflated or the wheel hung up for storage. A bicycle left on flat tires for an extended period may damage the tires' sidewalls.

What is a bicycle tube made of?

Butyl

A bicycle tube is predominantly made of Butyl rubber. Butyl is a very elastic and airtight synthetic rubber, but as with the tire, other fillers are necessary to make up the rubber compound. The quality of a tube can vary significantly depending on the rubber compound. For instance SCHWALBE tubes have very good air retention and are very elastic. This high elasticity allows a wide range of different tire sizes to be covered.

Mold curing Autoclave curing

There is a difference between heat molded and autoclave tubes. Vulcanizing in a mould improves the uniformity of wall thickness, thus reducing weight and improving air retention. This is why the inferior yet more easily produced autoclave tubes have become increasingly less popular in recent years. SCHWALBE tubes have always been made using the heat molded process.

Every tube also needs a valve, which is bonded to the tube during the vulcanizing process.

What are the advantages of latex tubes?

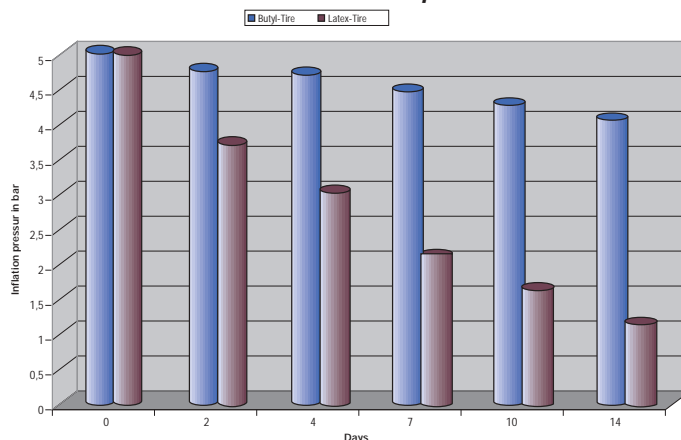
Latex

Latex tubes have a higher elasticity than normal butyl tubes that allows tires to roll better, but the greatest advantage is the high level of puncture protection they provide. The highly elastic latex material is very difficult to puncture.

The drawback is poor air retention, as tire pressures with a latex tube must be checked and adjusted before every ride. This explains why latex tubes are ill suited for everyday use.

In addition, latex tubes are very sensitive to oil, daylight and heat. The tube must also be replaced every time a tire is changed. This susceptibility has led us to discontinue latex tube production.

Air retention comparison



Which is the best valve?

There are three types that have become market standards and it is difficult to make any particular recommendation. The most important aspect is that the valve fits the rim valve hole and that an appropriate pump is available.

Contrary to popular belief, major air retention differences are now a thing of the past. In any event, SCHWALBE valves certainly provide excellent performance and are adapted to high-pressure use.

Traditional
bicycle valve
Dunlop valve
Woods valve
English valve
“Blitzventil”

The traditional bicycle valve or Dunlop valve is still the most common worldwide and most cyclists are familiar with it.

The valve core is easily replaced and the air can be released very quickly.

Fitting a tube with a Dunlop valve is more awkward, as the valve core and locknut need to be removed in order to fit the valve through the valve hole. Inflation is only possible once the core and the nut are back in place.

With traditional Dunlop valves, it is impossible to check the inflation pressure. However, the special SCHWALBE Dunlop valve allows a return airflow, so that it is now possible to check the inflation pressure with an AIRMAX pressure gauge.

In former times it was difficult to inflate a tube with a Dunlop valves, but with today's modern valve cores, this is no longer the case.



Traditional bicycle valve

Sclaverand valve
Presta valve
French valve
High Pressure valve

Racing bicycle valve The Sclaverand valve at 6 mm instead of 8 mm is much smaller than other valves, requires a smaller valve hole and so is very well suited for racing bicycle rims.

It is also 4 – 5 g lighter than a car valve or Dunlop valve.

The top nut can be turned by hand and has to be opened before inflation, which surprises many first-time users. Also the thin top pin can be bent easily when attaching and removing the pump connector.

Be warned that using Sclaverand valves tubes on rims with larger valve holes often leads to valves shearing off



Sclaverand valve

Auto valve
Car valve
Schrader valve

when the sharp metal edges around the valve hole cut the valve stem off the tube.

American valve The auto valve is becoming increasingly popular as it can easily be inflated at service stations and is very user friendly.

Older, as well as simple bicycle pumps are not compatible with auto valves.



Automotive valve

Regina valve
Italian valve

The Regina valve looks very much like the French valve and is used almost exclusively in Italy.



Regina valve

Valve tear off

What causes valve tear off?

Valve hole

A valve can be torn off if it has been installed under tension.

Another frequent cause is installing a Sclaverand valve tube into a rim with a larger valve hole. The metal edge of the valve hole can shear the valve stem off the tube.

Be aware that there are also rims around that have the correct valve hole of 6.5 mm on the outside, but a larger hole of 8.5 mm on the inside, which causes the problem.

The rim nut should only be tightened lightly by hand. A nut that is tightened excessively just exacerbates the problem of tear off. The major role of the rim nut is to lock the valve in place at the time of inflation.

Tire/Rim Slip

Torn off valves are often seen on mountain bikes. Continually improving brake performance and low inflation pressures often cause tires to slip on the rim. The tube is then dragged by the tire movement and this can lead to the valve shearing off. In order to prevent this from happening we developed LIMITED SLIP TECHNOLOGY (LST) used on our mountain bike tires. The tire bead is coated with a special rubber layer that produces a dramatic reduction in tire/rim slip.



Valve stem torn off because of wrong valve hole size



Rim with too large valve hole



Rim with correct valve hole

Fitting instructions

What is the correct way to fit a tire?

- All spoke holes must be completely and securely covered with an appropriate rim tape.
- Observe any rolling direction markings on the tire sidewall.
- Never use sharp fitting tools.
- Pull one tire side onto the rim (fig.1)
- Slightly inflate the tube until it is round.
- Fit the valve through the valve hole in the rim.
- Place the tube into the tire. (Fig. 2)
- Starting at the opposite side to the valve fit the other tire side onto the rim.
- Ensure the tube is not pinched between the rim and the tire.
- The valve should be in an upright position.
- Center the tire before inflating it to the required pressure.
- Adjust the inflation pressure using a pressure gauge, e.g. the AIRMAX pressure gauge. The permissible pressure range is marked on the tire sidewalls. The higher the inflation pressure, the lower the rolling resistance, the tire wear and the less likelihood of a puncture.
- The inflation pressure should be checked at least once a month.



Why is it sometimes so difficult to fit a tire?

Difficult fitting

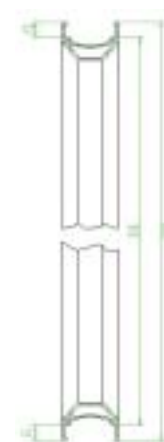
Fitting difficulties often arise when the diameters of the rim and the tire do not match perfectly.

Manufacturing tolerances

Rims can have a diameter tolerance of ± 0.5 mm. In addition, each rim flange height can also have a tolerance of ± 0.5 mm. These figures add up to a total diameter tolerance of ± 1.5 mm, or 4.7 mm over the circumference. This corresponds to a maximum possible circumferential difference of 9.4 mm between the largest and the smallest rim.

A tire has to fit on both extremes, so because a safe fit has to be ensured even on the smallest permissible rim diameter, the proper centering of the tire on the largest permissible rim can prove quite difficult.

The circumferential tolerance of SCHWALBE tires is ± 1 mm.



Tolerances of crotchet type rims according to ETRTO:

D1 Bead seat diameter
= $\pm 0,5$ mm

G Rim flange height
= $\pm 0,5$ mm

D2 Outer rim diameter
 $D1 + 2 \times G = \pm 1,5$ mm

U Rim circumference
 $D2 \times \pi = \pm 4,71$ mm

Solving fitment problems

How do I fit a tire that is hard to center?

When the rim diameter is at maximum tolerance and the tire diameter is at minimum, it is difficult to get the tire beads onto the rim bead seat.

Solution:

Slightly over-inflate the tire for a short time, or put soapy water onto the tire beads to make them slip into place more easily.

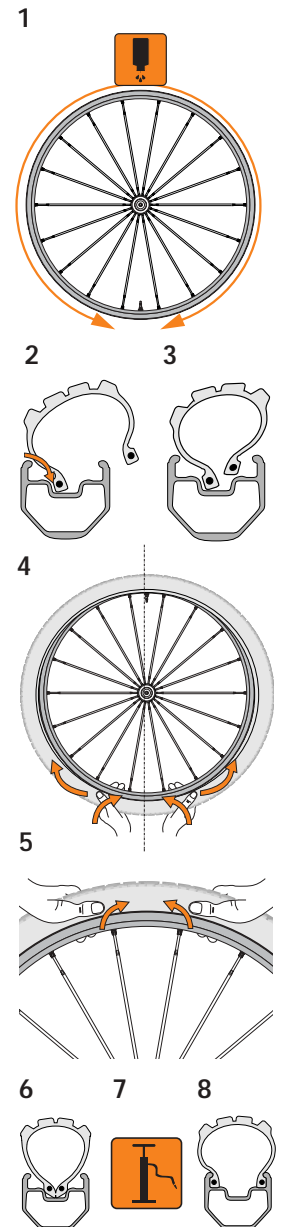
When the rim diameter is at minimum and the tire diameter at maximum, the tire cannot be seated properly irrespective of the inflation pressure. This situation can generally be addressed by centering the tire by hand at low inflation pressure. Move the tire until the rim line is parallel to the rim all around the tire.



Rim line

How are tubeless tires fitted?

- Wet the rim well with a recommended lubricant or soapy water (1).
- Fit one of the tire beads onto the rim (2).
- Fit the other tire bead onto the rim. It is important to start on the side that is opposite to the valve. (3) (4).
- Verify the tire is correctly seated all around the rim (5) (6). Check that the valve is between the tire beads.
- Inflate the tire quickly until both beads jump up into place, confirmed by an audible 'pop' (7) (8).
- Using the rim line, make sure that the tire is properly in place. The rim line must be parallel to the rim flange all the way around.
- Adjust the inflation pressure to your requirements taking into consideration the pressure markings on the tire and the manufacturer's recommendations.



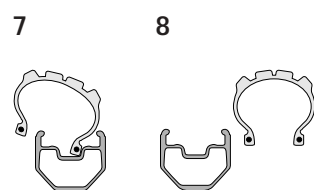
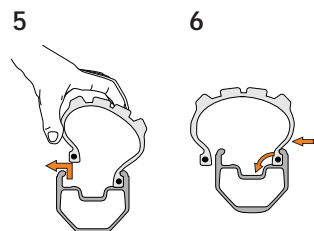
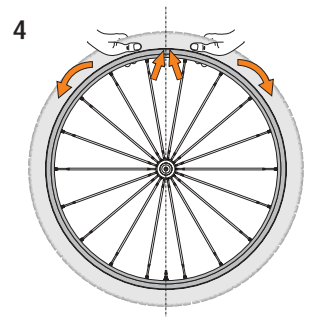
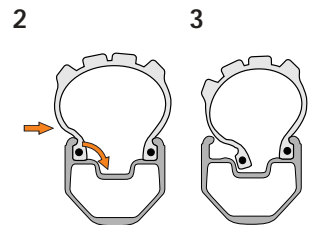
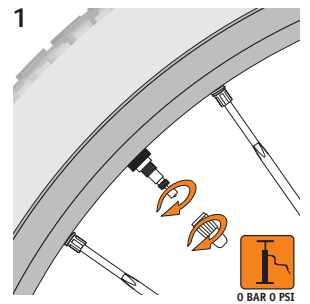
Fitting a tubeless tire

UST

Removing a tubeless tire

Removing a tubeless tire

- Deflate the tire.
- First loosen only one tire side by pressing the tire bead into the rim well (2) (3) (4).
- Starting next to the valve, lift the tire bead over the rim flange (5).
- Loosen the opposite tire bead by pushing it into the rim well (6) (7).
- Remove the tire (8).



Repairing a tubeless tire

How are tubeless tires repaired?

- The tire can be repaired from the inside with all standard repair patches.
- It is also possible to install a tube, but first, in order to do so, the valve must be unscrewed from the rim. Refer to the sections on fitting and removing a tubeless tire.

Importance

Why is inflation pressure so important in bicycle tires?

Only a tire with sufficient inflation pressure can bear the weight of a bicycle. The higher the inflation pressure, the lower the rolling resistance and higher pressure also reduces the likelihood of a puncture.

Long-term, under-inflation often leads to premature tire wear and aging, commonly resulting in sidewall cracking and increased tire wear.

On the other hand, an under-inflated tire absorbs road shocks better.

Wide tires are generally used at low pressure. The advantages are that the large air volume absorbs road bumps and holes without the drawbacks of high rolling resistance, less puncture protection and tire wear.

Sidewall wear



Constant use at 1.5 bar



Constant use at 4.5 bar

How often should tire pressures be checked?

Pressure checking

The inflation pressure should be checked and adjusted at least once a month. Even the best tubes constantly lose pressure as, contrary to car tires, the pressure required in bicycle tires is much higher and wall thickness is much thinner. A pressure loss of 1 bar per month can be viewed as normal, but pressure loss will be much faster if high inflation pressures are used and much slower when low inflation pressures are preferred.

When using latex tubes, it is best to check and adjust inflation pressures before every ride.

Use a pressure gauge to monitor inflation pressure. The widespread thumb-test method is very inaccurate as all tires will feel identically hard from a pressure of 2 bar up.



Inflation pressure checking with AIRMAX pressure gauge

What is the correct inflation pressure for my tire?

Correct inflation pressure

Weight

Individual preferences

Recommended inflation pressure

It is impossible to make a general recommendation on inflation pressure for a specific bicycle or a particular tire. The "right" inflation pressure depends mainly on the load exerted on the tire. This weight is mainly influenced by the weight of the rider and any luggage. Contrary to a car, the vehicle weight is only a minor part of the total weight. In addition there is a great diversity of individual preferences with regard to low rolling resistance or suspension comfort.

The permitted inflation pressure range is marked on the tire sidewall. Remember that the higher the inflation pressure, the lower are the rolling resistance, wear and likelihood of a puncture. The lower the inflation pressure, the higher are the comfort and grip that the tires provide.

The list of inflation pressure recommendations on the right can only provide a very general guide. The recommendations are for an "average rider" weighing about 75 kg.

If you are heavier or carry luggage, you should choose a higher inflation pressure. You can also increase the inflation pressure if you prefer lower rolling resistance. It is recommendable that higher inflation pressures are used on very small diameter tires such as low profile race bikes and folding bikes.

Lighter weight riders or riders who prefer a comfortable ride can choose an accordingly lower inflation pressure, but the actual tire pressures should never be higher or lower than the maximum and minimum inflation pressures marked on the tire sidewall.

Tire Section width	Recommended inflation pressure
20 mm	7,5-9,0 bar
23 mm	7,5-8,0 bar
25 mm	7,0 bar
28 mm	6,0 bar
30 mm	5,5 bar
32 mm	5,0 bar
35 mm	4,5 bar
37 mm	4,5 bar
40 mm	4,0 bar
42 mm	4,0 bar
44 mm	3,5 bar
47 mm	3,5 bar
50 mm	3,0 bar
54 mm	2,5 bar
57 mm	2,2 bar
60 mm	2,0 bar

Importance

The rim tape protects the tube from mechanical damage by spoke ends, metal burrs and holes in the rim.

Which rim tape should I use?

Correct rim tape

An appropriate rim tape must completely and securely cover all spoke holes. The entire rim well is covered, the tape cannot move.



Der komplette Felgenboden ist bedeckt. Das Band kann nicht verrutschen.

Hollow section rim

Hollow section rims require the use of special rim tapes such as SCHWALBE Super HP or SCHWALBE fabric rim tape. Rubber rim tapes are not suitable for hollow section rims, because the inflated tube pushes them into the holes.



A rubber rim tape presses into the hole of a hollow section rim.

High pressure rim tape

Rubber rim tape

The rim tape must cover the entire rim well. If the rim tape is narrower than the rim well it can slide and expose the spoke holes.

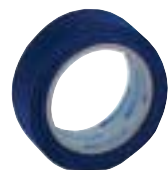


The rim tape is too narrow and does not secure the rim well.

Fabric rim tape

Auf der folgenden Seite empfehlen wir für die meisten marktgängigen Felgen ein Band, dass die sichere Abdeckung des Felgenbodens gewährleistet.

Alternatively, an adhesive, fabric rim tape can be used on all rims. Slipping cannot occur due to the heat resistant glue. The 19mm wide tape should definitely be used for racing bicycle rims (13C, 14C). The 15mm tape is recommended for the various hollow section and straight side cycle rims, which are often used on MTB and trekking bikes.



SCHWALBE fabric rim tape.

Why doesn't SCHWALBE produce a 12 mm rim tape?

12 mm wide rim tape

Some rims have a rim well with a width of about 12 mm. It is intentional on our part not to provide a rim tape of 12 mm or less. Such a narrow tape would provide a very narrow and insecure cover.



The cover with a 12 mm tape is narrow and insecure.

Instead, we recommend using a wide tape that reaches from rim wall to rim wall. This may complicate the fitting process, but it provides the best option for a secure covering of all rim holes.



A wide tape that reaches from rim wall to rim wall is a more secure solution.

Rim	Super HP rim tape	
Alesa		
Columbia R	406 x 19	22-406
X-Plorer	406 x 19	22-406
6021	559 x 21	14-559
9021	559 x 21	14-559
Apollo, Apollo R, (617, 6017)	559 x 17	22-559
Columbia, Columbia R, (6019)	559 x 19	22-559
Discovery	559 x 19	22-559
Endeavour, Endeavour R, (917, 9017)	559 x 17	20-559
Hard Rock	559 x 17	20-559
Sputnik, Sputnik R, (9019)	559 x 19	22-559
Stratos	559 x 19	22-559
X-Plorer, X-Plorer R	559 x 19	22-559
Zac 19, Zac 19 R, Zac 19 R offset	559 x 19	22-559
Zac 2000	559 x 19	22-559
Chaser	571 x 13	16-571
6021	622 x 21	14-622
9021	622 x 21	14-622
Apollo, Apollo R, (617, 6017)	622 x 17	22-622
Chaser	622 x 13	16-622
Columbia, Columbia R, (6019)	622 x 19	22-622
Discovery	622 x 19	22-622
Endeavour, Endeavour R, (917, 9017)	622 x 17	20-622
Sputnik, Sputnik R, (9019)	622 x 19	22-622
Stratos	622 x 19	22-622
X-Plorer, X-Plorer R	622 x 19	22-622
Zac 19, Zac 19 R	622 x 19	22-622
Zac 2000	622 x 19	22-622
Ambrosio		
Barracuda disc	559 x 17	20-559
C.C. 22	559 x 17	20-559
C.C. 24	559 x 17	22-559
C.X. 22	559 x 17	20-559
Camel	559 x 17	20-559
Compact	559 x 20	22-559
D.H. 28	559 x 22	25-559
Performance	559 x 25	25-559
Quorum	559 x 17	20-559
Tank	559 x 16,5	20-559
Texas 24	559 x 18	20-559
The Frog	559 x 17	20-559
Balance	571 x 13,5	16-571
Elite Prisma	571 x 13	16-571
Aero Elite	622 x 13,4	16-622
Ambrosio 19E	622 x 14	16-622
Arizona	622 x 20	22-622
Balance	622 x 13,5	16-622
Club	622 x 17	20-622
Elite Prisma	622 x 13	16-622
Evolution	622 x 13,5	16-622
Excellence	622 x 13,1	16-622
Excellight	622 x 13	16-622
Excursion	622 x 13,5	16-622
Focus	622 x 13,5	16-622
Gentleman	622 x 14	16-622
Giro d'Italia	622 x 13,5	16-622
Mr. Martin	622 x 14,5	16-622
Nexus	622 x 13,5	16-622
Prestige	622 x 17	20-622
Super Elite	622 x 13,5	16-622
Texas 24	622 x 18	20-622
Fir		
AG 36	559 x 17	20-559
Ciocco 91	559 x 16	20-559
Down Hill	559 x 19	22-559
EA 10	559 x 14	20-559
Helix	559 x 17	20-559
M 123	559 x 17	20-559
MS 29 Downhill	559 x 22	22-559
MT 122	559 x 17	22-559
MT 231	559 x 17	20-559
MT 232	559 x 17	20-559
Polar	559 x 17	20-559
W 400	559 x 17	20-559
W 420	559 x 17	20-559
Aria	571 x 13	18-571
EA 60	571 x 14	16-571
Rialto	571 x 12	18-571
SRG 40	571 x 13	18-571
Apollo	622 x 13	16-622
Aria	622 x 13	18-622
CS 17	622 x 13	16-622
EA 60	622 x 14	16-622
EA 65	622 x 14	18-622
EL 25	622 x 13	16-622
Geo 194	622 x 16	20-622
Piuma	622 x 13	16-622
Rialto	622 x 12	18-622
SC 150	622 x 14	18-622

Rim	Super HP rim tape	
SC 170	622 x 13	16-622
SC 200	622 x 13	16-622
SC 300	622 x 13	16-622
SC 350	622 x 13	16-622
SRG 30	622 x 13	16-622
SRG 40	622 x 13	18-622
Grünert		
Dynamic 4	406 x 19	22-406
Dynamic 4	406 x 21	14-406
Security Rim 2	406 x 19	22-406
Security Rim 3	406 x 19	22-406
Top-Basic	406 x 17	22-406
Top-Basic	406 x 19	22-406
Top-Drive	406 x 17	22-406
Top-Drive	406 x 19	22-406
Top-Fun	406 x 19	22-406
Top-Fun	406 x 21	22-406
Top-Orbit	406 x 19	22-406
Dynamic 4	507 x 19	22-507
Dynamic 4	507 x 21	14-507
Dynamic 5	507 x 19	22-507
Pro Disk 1	507 x 21	22-507
Pro Disk 2	507 x 21	22-507
Pro Disk 3	507 x 19	20-507
Security Rim 2	507 x 19	22-507
Security Rim 3	507 x 19	22-507
Top-Basic	507 x 17	22-507
Top-Basic	507 x 19	22-507
Top-Drive	507 x 17	22-507
Top-Drive	507 x 19	22-507
Top-Fun	507 x 19	22-507
Top-Fun	507 x 21	22-507
Top-Orbit	507 x 19	22-507
Top Power	507 x 19	20-507
Dynamic 3	559 x 15	20-559
Dynamic 4	559 x 19	22-559
Dynamic 4	559 x 21	14-559
Dynamic 5	559 x 19	22-559
Dynamic 6	559 x 19	22-559
Pro Disk 1	559 x 21	22-559
Pro Disk 2	559 x 21	22-559
Pro Disk 3	559 x 21	20-559
Security Rim 1	559 x 19	22-559
Security Rim 2	559 x 19	22-559
Security Rim 3	559 x 19	22-559
Top-Basic	559 x 17	22-559
Top-Basic	559 x 19	22-559
Top-Drive	559 x 17	20-559
Top-Drive	559 x 19	22-559
Top-Orbit	559 x 19	22-559
Top Power	559 x 19	20-559
Dynamic 3	622 x 15	20-622
Dynamic 4	622 x 19	22-622
Dynamic 4	622 x 21	14-622
Dynamic 5	622 x 19	22-622
Dynamic 6	622 x 19	22-622
Pro Disk 1	622 x 21	22-622
Pro Disk 2	622 x 21	22-622
Pro Disk 3	622 x 19	20-622
Security Rim 1	622 x 19	22-622
Security Rim 2	622 x 19	22-622
Security Rim 3	622 x 19	22-622
Top-Basic	622 x 17	22-622
Top-Basic	622 x 19	22-622
Top-Drive	622 x 17	20-622
Top-Drive	622 x 19	22-622
Top-Orbit	622 x 19	22-622
Top Power	622 x 19	20-622
Mavic		
Xx	406 x 21	22-406
121	559 x 21	22-559
217/ 217D	559 x 17	22-559
220	559 x 17	22-559
221/ 221N	559 x 17	22-559
238/ 238N	559 x 17	22-559
D 521	559 x 21	25-559
F 519	559 x 19	22-559
X 138/ X 138N	559 x 17	20-559
X 221/ X 221N	559 x 17	22-559
X 222	559 x 17	20-559
X 317 disc	559 x 17	20-559
X 517	559 x 17	20-559
X 618	559 x 18	20-559
CXP 12	571 x 13	18-571
CXP 14	571 x 13	16-571
CXP 33	571 x 13	18-571
Open Pro	571 x 13	18-571
Axcell	622 x 14,5	18-622
CXP 10	622 x 13	16-622

Rim	Super HP rim tape	
CXP 11	622 x 14,6	18-622
CXP 12	622 x 13	18-622
CXP 14	622 x 13	16-622
CXP 21	622 x 14,6	18-622
CXP 30	622 x 13	18-622
CXP 33	622 x 13	18-622
MA	622 x 13	18-622
MA 3	622 x 13	18-622
Open 20/ Open 20D	622 x 13	18-622
Open Pro	622 x 13	18-622
Reflex	622 x 13	18-622
T 138	622 x 17	22-622
T 217	622 x 17	22-622
T 221	622 x 17	22-622
T 223	622 x 17	22-622
T 238	622 x 17	22-622
T 261	622 x 20	22-622
T 519	622 x 19	22-622
Rigida		
Laser	406 x 19	22-406
Laser	507 x 19	22-507
Aries, Aries R	559 x 17	20-559
DP 22, DP 22 R	559 x 16	20-559
DP 25	559 x 19	22-559
DP 2000	559 x 19	22-622
Grizzly	559 x 18	20-559
Laser	559 x 19	20-559
Libra	559 x 19	22-559
Mensa	559 x 21	25-559
Norma	559 x 16	20-559
Orion	559 x 21	25-559
Phoenix	559 x 17	20-559
Sirius	559 x 19	22-559
SLP	559 x 16	20-559
Taurus	559 x 17	20-559
Taurus 2000	559 x 19	22-559
Tucana, Tucana R	559 x 17	20-559
Turbo 9	559 x 17	20-559
XC 420	559 x 17	20-559
DP 18, DP 18 R	571 x 13	16-571
Nova, Nova R	571 x 13	16-571
Aries R	622 x 17	20-622
Chrina, Chrina R	622 x 13,5	16-622
DP 18, DP 18 R	622 x 13	16-622
DP 25	622 x 19	22-622
DPX	622 x 13	16-622
DP 2000	622 x 19	22-622
Excel	622 x 13	16-622
Laser	622 x 19	20-622
Libra, Libra R	622 x 19	22-622
Mensa	622 x 21	25-622
Nova, Nova R	622 x 13	16-622
Orion	622 x 21	25-622
Phoenix	622 x 17	20-622
Sirius	622 x 19	22-622
SHP 60	622 x 13	16-622
Taurus 2000	622 x 19	22-622
Vela	622 x 13	16-622
Schürmann		
Double Master Tour 17	507 x 17	20-507
Double Master Sprint 19	559 x 19	22-559
Double Master Tour 17	559 x 17	20-559
Double Master Tour 21	559 x 21	14-559
Downhill 25	559 x 25	25-559
Jetline Reflex	559 x 19	22-559
Double Master Sprint 19	622 x 19	22-622
Double Master Tour 17	622 x 17	20-622
Double Master Tour 21	622 x 21	14-622
Double Master Ultra 17	622 x 17	20-622
Jetline Reflex	622 x 19	22-622
Syncros		
Syncros R offset	559 x 19,5	22-559
Syncros XLR	559 x 17	20-559
Syncros XLT	559 x 17	20-559
Vuelta (Rodri)		
Air Line 1	406 x 21	22-406
Air Line 1	507 x 21	22-507
Air Line 1	559 x 19	25-559
Air Line 1	559 x 21	25-559
Air Line 3	559 x 21	25-559
Tempest	559 x 20	22-559
Air Line 1	622 x 19	25-622
Air Line 1	622 x 21	25-622
Air Line 2	622 x 13	16-622
Air Line 3	622 x 21	25-622
Tempest	622 x 20	22-622