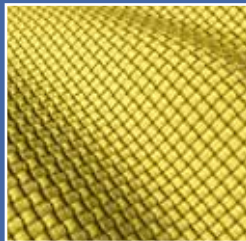
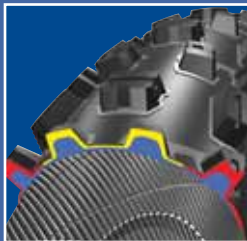




Technical Info

Bicycle Tires



Facts
Knowledge
Technology
Tips

**Our Customers
know more**

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What do the various size specifications on bicycle tires mean?

ETRTO

Nowadays, bicycle tire sizes are all marked according to **ETRTO** (European Tire and Rim Technical Organization) European standard. However, older English and French tire size dimensions are still used as well.

37-622

The ETRTO size specification 37-622 indicates the width of 37 mm and the tire inner diameter of 622 mm. This dimension is clear and allows for precise classification of the rim size.

28 x 1 ⁵/₈ x 1 ³/₈

28 x 1.40

Inch Sizes

Inch Marking (e.g. 28 x 1.40) states the approximate outer diameter (28 inches) and the tire width (1.40 inches). Inch marking such as 28 x 1 ⁵/₈ x 1 ³/₈ (approximate outer diameter x tire height x tire width) is also common.

Inch sizes are not precise and lack accuracy. For example, diameters 559 mm (MTB), 571 mm (Triathlon) and 590 mm (Touring) are all classified as 26 inch. Tires with diameters 622 mm and 635 mm are both classified as 28-inch. Oddly enough, tires with an inner diameter of 630 mm are classified as 27-inch.

These classifications originate from the time of tire brakes. In those days, the exact outer diameter of the tire was defined by the brake. Depending on tire width, various standards for the inner diameter applied.

Inch dimensions are widely used in both MTB sport and English language countries. Therefore, we will continue to use these specifications for all tires. In the future, only inch decimal measurements will be used e.g. 26 x 2.25. Experience tells us that nowadays very few users are familiar with the classical fractional **inch dimensions** such as, 28 x 1 ⁵/₈ x 1 ³/₈.

29 Inch

When the 29 inch MTB tire size was introduced a few years ago it had the same inner diameter of 622mm, known as 28" in Europe.

700 x 35C French Size Marking

French size markings (e.g. 700 x 35C) give the approximate tire outer diameter (700 mm) and width (35mm). The letter at the end indicates the inner diameter of the tire. In this case, C stands for 622 mm. French size markings are not used for all tire sizes, so, for example, it is not used for MTB sizes.



Size Markings Overview:

	ETRTO	Inch	French
Size Marking	37-622	28 x 1,40 28 x 1⁵/₈ x 1 ³/₈	700 x 35C
Outer Diameter	-	Approx. 28 Inch	Approx. 700 mm
Inner diameter	622 mm	-	-
Tire width	Approx. 37 mm	Approx. 1 ³ / ₈ Inch Approx. 1,40 Inch	Approx. 35 mm
Tire Height	-	Approx. 1 ⁵ / ₈ Inch	-

How many tire sizes are there?

The following list shows all common tire sizes.

For virtually every tire size, you should be able to find a corresponding ETRTO-size in this list.

	ETRTO	Inch	French		ETRTO	Inch	French		ETRTO	Inch	French	
7"	47-93	7 x 1 1/4		20"	60-406	20 x 2.35		26"	23-571	26 x 7/8	650 x 22C	
	8"	47-94	20 x 47-50 8 x 2			54-428	20 x 2.00			40-571	26 x 1 1/2 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
		50-94	200 x 50			40-432	20 x 1 1/2			47-571	26 x 1 1/4	650 x 45C
		54-110	8 1/2 x 2 1/8 8 1/2 x 2			37-438	20 x 1 1/8		500A	54-571	26 x 2 x 1 1/4	650 x 50C
		32-137	8 x 1 1/4			40-438	20 x 1 1/8 x 1 1/2		500 x 38A	28-584	26 x 1 1/8 x 1 1/2	650 x 28B
10"	54-152	10 x 2			28-440		500 x 28A 500A 500A Standard		32-584	26 x 1 1/8 x 1 1/2	650 x 32B	
	44-194	10 x 1 1/8			37-440		500 x 35A 500A Confort 500A Ballon 500A 1/2 Ballon		35-584	26 x 1 1/8 x 1 1/2	650 x 35B 650B Standard	
11"	47-222	11 x 1 1/4			22"	40-440	20 x 1 1/2 NL		500 x 38A	37-584	26 x 1 1/8 x 1 1/8 26 x 1 1/2	650 x 35B
12"	47-203	12 1/2 x 1.75 12 1/2 x 1.90				28-451	20 x 1 1/8			40-584	26 x 1 1/8 x 1 1/2 26 x 1 1/2	650 x 35B 650 x 38B
	50-203	12 x 2.00				37-451	20 x 1 1/8 B.S.			44-584	26 x 1 1/8 x 1 1/2	650 x 42B 650B Semi-Confort 650B 1/2 Ballon
	54-203	12 x 1.95				44-484	22 x 1 1/8 x 1 1/2			54-584	26 x 1 1/2 x 2	650 x 20A
	57-203	12 1/2 x 2 1/4 R				25-489	22 x 1.00			20-590	26 x 1 1/8, 1 1/4 26 x 1 1/8 x 1 1/8 - 1 1/4	650 x 25A
	62-203	12 1/2 x 2 1/4				37-489	22 x 1 1/8 NL			28-590	26 x 1 1/8	650 x 28A
	32-239	12 1/2 x 1 1/8 x 1 1/4	300 x 32A			40-489	22 x 1 1/8 x 1 1/2			32-590	26 x 1 1/8 x 1 1/4	650 x 32A
	57-239	12 1/2 x 2 1/4	300 x 55A			50-489	22 x 2.00			35-590	26 x 1 1/8	650 x 35A 650A
14"	57-251	14 1/2 x 2 1/4	300 x 55A	28-490			550 x 28A 550A 550A Standard	37-590	26 x 1 1/8	650 x 35A 650A		
	47-254	14 x 1.75 14 x 1.90		32-490		22 x 1 1/8 x 1 1/4	550 x 32A 550A	40-590	26 x 1.50 26 x 1 1/8 x 1 1/2	650 x 38A		
	50-254	14 x 2.00		37-490		22 x 1 1/8	550 x 35A 550A Confort 550A Ballon 550A 1/2 Ballon	44-590				
	40-279	14 x 1 1/2	350 x 38B	37-498		22 x 1 1/8 x 1 1/4		32-597	26 x 1 1/4			
	37-288	14 x 1 1/8 x 1 1/8	350A 350A 350A Confort 350A Ballon 350A 1/2 Ballon 350 x 32A	32-501		22 x 1 1/4		27"	40-609	27 x 1 1/2		
	40-288	14 x 1 1/8	350 x 38A	37-501		22 x 1 1/8			20-630	27 x 3/4		
	44-288	14 x 1 1/8 x 1 1/8	350A 350 x 42A	40-507		24 x 1.50			22-630	27 x 7/8		
	32-298	14 x 1 1/4	350A 350 x 32A	44-507	24 x 1.625 24 x 1.75		25-630		27 x 1.00 27 x 1 1/8			
	16"	40-305	16 x 1.50		47-507	24 x 1.75 24 x 1.85/1.90			28-630	27 x 1 1/8		
		47-305	16 x 1.75 16 x 1.90		49-507	24 x 1.85			28-630	27 x 1 1/8 27 x 1 1/4 Fifty		
50-305		16 x 2.00		50-507	24 x 1.90/2.00 24 x 2.00		32-630		27 x 1 1/4			
54-305		16 x 1.95 16 x 2.00		54-507	24 x 2.125		28/32-630		27 x 1 1/4			
57-305		16 x 2.125		57-507	24 x 2.125 24 x 2.00		35-630		27 x 1 1/8			
40-330		16 x 1 1/2	400 x 38B	60-507	24 x 2.35		28"		18-622	28 x 3/4	700 x 18C	
28-340		16 x 1 1/2	400 x 30A	62-507	24 x 2.40				19-622		700 x 19C	
32-340		16 x 1 1/8 x 1 1/4	400A 400 x 32A	23-520	24 x 7/8				20-622	28 x 3/4	700 x 20C	
37-340		16 x 1 1/8	400 x 35A 400A Confort 400A Ballon 400A 1/2 Ballon	44-531	24 x 1 1/8 x 1 1/2				22-622	28 x 7/8	700 x 22C	
44-340		16 x 1 1/8		40-534	24 x 1 1/2				23-622	28 x 7/8	700 x 23C	
28-349		16 x 1 1/8		25-540	24 x 1.00				25-622	28 x 1.00 28 x 1 1/8	700 x 25C	
32-349		16 x 1 1/4 NL		32-540	24 x 1 1/8 x 1 1/4 24 x 1 1/8			28-622	28 x 1.10 28 x 1 1/8 x 1 1/8	700 x 28C		
35-349		16 x 1.35		37-540	24 x 1 1/8			30-622	28 x 1.20	700 x 30C		
37-349		16 x 1 1/8		40-540	24 x 1 1/8 x 1 1/2			32-622	28 x 1.25 28 x 1 1/8 x 1 1/4	700 x 32C 700C COURSE		
17"		32-357	17 x 1 1/4		22-541			600 x 25A	35-622	28 x 1.35 28 x 1 1/8 x 1 1/8	700 x 35C	
	32-369	17 x 1 1/4		25-541		600 x 28A 600A 600A Standard		37-622	28 x 1.40 28 x 1 1/8 x 1 1/8	700 x 35C		
18"	28-355	18 x 1 1/8		28-541		600 x 32A 600 x 35A 600A Confort 600A Ballon 600A 1/2 Ballon		40-622	28 x 1.50 28 x 1 1/8 x 1 1/2	700 x 38C		
	35-355	18 x 1.35		32-541	24 x 1 1/8 x 1 1/4 NL			42-622	28 x 1.60	700 x 40C		
	40-355	18 x 1.50		37-541				44-622	28 x 1.625	700 x 42C		
	47-355	18 x 1.75 18 x 1.90		25-559	25 x 2.25			47-622	28 x 1.75	700 x 45C		
	50-355	18 x 2.00		26-559	26 x 1.00		50-622	28 x 1.90 28 x 2.00				
	37-387	18 x 1 1/8		28-559	26 x 1.10		54-622	28 x 2.10 29 x 2.10				
	40-387	18 x 1 1/2		35-559	26 x 1.35		57-622	28 x 2.10 29 x 2.10				
	28-390	18 x 1 1/8	450 x 28A 450A	37-559	26 x 1 1/8 x 1 1/8 26 x 1.40		60-622	28 x 2.35				
	37-390	18 x 1 1/8	450 x 35A 450A 450A Confort 450A Ballon 450A 1/2 Ballon	42-559	26 x 1.50		32-635	28 x 1 1/8 x 1 1/8	770 x 28B 700 x 28B 770B COURSE			
	55-390		450 x 55A	44-559	26 x 1.625 26 x 1.50/1.75		40-635	28 x 1 1/2 28 x 1 1/8 x 1 1/8	700 x 38B 700 x 35B 700 Standard 700B Standard			
57-390		450 x 55A 450A	47-559	26 x 1.75 26 x 1.85/1.90		44-635		28 x 1 1/8 x 1 1/2	700 x 40/42B			
37-400	18 x 1 1/8		50-559	26 x 1.90 26 x 1.95 26 x 1.90/2.00 26 x 2.00/2.10		28-642		28 x 1 1/8 x 1 1/8	700 x 28A			
20"	54-400	20 x 2 x 1 1/4 20 x 2 F 4J		54-559	26 x 1.95 26 x 2.10 26 x 2.125			37-642	28 x 1 1/8	700 x 35A		
	28-406	20 x 1 1/8		57-559	26 x 2.125							
	32-406	20 x 1.25		57-559	26 x 2.20/2.25							
	35-406	20 x 1.35		60-559	26 x 2.35							
	37-406	20 x 1 1/8		62-559	26 x 2.40 26 x 2.50							
	40-406	20 x 1.50		20-571	26 x 3/4	650 x 20C						
	42-406	20 x 1.60										
	44-406	20 x 1.625										
	47-406	20 x 1.75 20 x 1.90										
	50-406	20 x 2.00										
	54-406	20 x 2.00										
	57-406	20 x 2.125										

Actual width
Standard width

Why are tires often narrower than the stated tire size?

Standard tire widths are calculated using fairly wide, standard rims. Yet in practice, narrower rims are used more often, which in turn leads to tires becoming slightly narrower as well.

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 (+/- 3 mm).

Carcass casing materials have become more and more sophisticated over time, that reduces the tire widening after the fitting. In order to correct this tire widening, over the past few years slightly wider carcasses have been used, so that the actual widths are now much closer to the standard widths.

Fitting dimensions
Maximum width
Maximum diameter

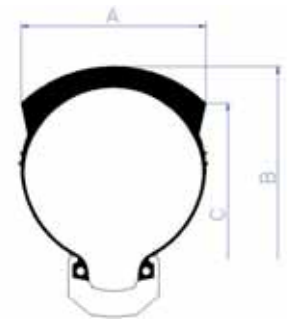
Will the tire fit my frame?

The question whether 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 it is impossible to check the compatibility of all frames and tires.

The following list shows the exact diameters and widths of our ultra-wide tires. This should allow you to identify if there is sufficient frame clearance for the selected tire.

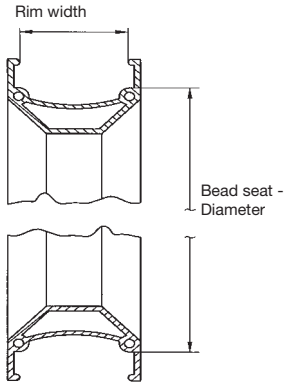
Inch	Tire		Maximum Width	Maximum Diameter	Bead Seat Diameter at Maximum Width
20"	Big Apple	60-406	60 mm	529 mm	469 mm
26"	Al Mighty	60-559	60 mm	684 mm	670 mm
	Al Mighty	65-559	65 mm	693 mm	673 mm
	Big Apple	60-559	60 mm	683 mm	616 mm
	Big Betty	62-559	61 mm	690 mm	668 mm
	Crazy Bob	60-559	61 mm	681 mm	625 mm
	Fat Albert	60-559	59 mm	688 mm	664 mm
	Fat Frank	60-559	61 mm	686 mm	635 mm
	Muddy Mary	64-559	65 mm	691 mm	664 mm
	Nobby Nic	62-559	60 mm	690 mm	664 mm
	Racing Ralph	62-559	59 mm	687 mm	660 mm
	Space	60-559	59 mm	682 mm	677 mm
28"	Big Apple	50-622	49 mm	727 mm	676 mm
	Big Apple	60-622	60 mm	745 mm	678 mm
	Little Albert	54-622	53 mm	711 mm	735 mm
	Marathon Supreme	50-622	49 mm	725 mm	676 mm
	Marathon XR	50-622	49 mm	725 mm	701 mm



A = Maximum width
B = Maximum diameter
C = Diameter at maximum width

Which tire fits which rim?

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 width must match the rim width. The following table shows possible combinations of tire widths and rim widths according to ETRTO.

Since 2006, the combination of extra wide tires and narrow 17C and 19C rims is officially approved by ETRTO. This just caught up with reality, because this combination has already been an every day occurrence in MTBs and Balloonbikes for many years and has not caused any problems.

Often the use of a wider rim is useful because it brings additional stability to the tire. The tire pressure can be reduced slightly before the stability becomes "spongy".

Rim width (mm)	Tire width (mm)															
	18	20	23	25	28	32	35	37	40	44	47	50	54	57	60	62
13C	X	X	X	X												
15C			X	X	X	X										
17C				X	X	X	X	X	X	X	X	X				
19C					X	X	X	X	X	X	X	X	X	X	X	X
21C							X	X	X	X	X	X	X	X	X	X
23C								X	X	X	X	X	X	X	X	X
25C									X	X	X	X	X	X	X	X
27C										X	X	X	X	X	X	X
29C													X	X	X	X

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 an exact tire circumference. 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 below.

Inch	ETRTO	Approximate Tire circumference	Inch	ETRTO	Approximate Tire circumference	Inch	ETRTO	Approximate Tire circumference
16"	50-305	1265 mm	24"	57-507	1955 mm	28"	28-622	2150 mm
	35-349	1325 mm		60-507	1980 mm		30-622	2160 mm
	37-349	1330 mm		62-507	1995 mm		32-622	2170 mm
18"	40-355	1380 mm	26"	35-559	1990 mm		35-622	2185 mm
	50-355	1440 mm		40-559	2030 mm		37-622	2200 mm
20"	35-406	1510 mm		47-559	2050 mm		40-622	2220 mm
	40-406	1540 mm		50-559	2075 mm		42-622	2230 mm
	47-406	1580 mm		54-559	2100 mm		47-622	2250 mm
	50-406	1600 mm		57-559	2120 mm		50-622	2280 mm
	54-406	1620 mm		60-559	2160 mm		54-622	2295 mm
	60-406	1650 mm		37-590	2100 mm		60-622	2330 mm
24"	47-507	1900 mm	28"	20-622	2100 mm		32-630	2200 mm
	50-507	1910 mm		23-622	2125 mm		40-635	2250 mm
	54-507	1930 mm		25-622	2135 mm			

Tire/
Rim Combination

Rim dimensions

Bead seat diameter

Rim width

Wide tires/
Narrow rims

Tire circumference

Bicycle computer

What components make up a tire?

A bicycle tire consists of three basic elements; the carcass, the bead core and the rubber tread. Furthermore, almost all Schwalbe tires have a puncture protection belt.

Bead core

The bead core of the tire determines its diameter and ensures a secure seat on the rim. Generally the bead core of a tire consists of a wire bundle. In folding tires, the wire is replaced with a hoop of aramid fibers.

Carcass

The carcass is the “framework” of the tire. The textile material is rubber coated on both sides and cut at a 45 degree angle. The carcass, with this angle placed in the rolling direction, provides for the future tire’s necessary stability. All Schwalbe carcasses are made of nylon. Depending on the quality requirements of the tire, the carcass materials are woven in various densities.

Rubber Compound Compound Rubber

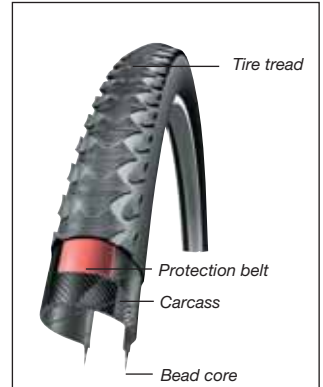
The rubber compound of a tire consists of several components:

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

Depending on the compound, rubber is around 40-60%. The filler amounts to 15-30% and the remaining components to approx. 20-35%.

Puncture Protection

Almost all Schwalbe tires have a puncture protection belt, with the exception of special lightweight and sports tires, where this feature is purposely excluded. Even our standard tires are equipped with an effective puncture protection belt made of natural rubber (Puncture Protection). MARATHON tires feature Kevlar®Guard, a remarkably high puncture protection made of natural rubber and Kevlar fibers. Furthermore, our top of the range tires have highly efficient puncture protection systems, which are specifically adapted to particular requirements, for example RaceGuard, SmartGuard and High Density Guard.



Natural rubber



Synthetic rubber

How is a bicycle tire manufactured?



Materials are specially selected and manufactured using a unique process. This is highly labor intensive – of course using the latest modern machinery.



The carcass is applied to the building drum, cut and then spliced. Next, the wire or aramid bundles are inserted and the carcass is folded from both sides. The 45 degree-angle carcass material is now layered and forms a tire with a diagonal structure.

In this phase, the selected puncture protection layer will be inserted. At last, the tread is applied exactly in the center of the tire.

But the green tire is still in a pliable form without a tread. Only during the vulcanization process, does the tire get its tread and its elastic properties.



The green tire is pressed into a tire mold by a special heating tube and – like in a waffle iron - vulcanized at approx. 170 degrees for five to six minutes.

Only after vulcanization can it be called rubber. Now the tire has its elastic properties and its tread.

At the end of the production processes, a strict quality control awaits every tire. Every tire is meticulously inspected. Continuous checking of random samples ensures correct weight and run-out.



**Special
manufacturing
process**

Vulcanization

Quality control

EPI
TPI

127 EPI

Comparison of EPI markings

What does carcass EPI mean?

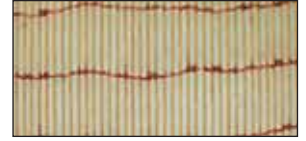
The density of the carcass fabric is expressed in EPI or TPI (Ends Per Inch, Threads Per Inch). The range of carcasses used for Schwalbe tires are 24, 37, 50, 67 and 127 EPI.

In principle, the more close-meshed a carcass is woven, the higher the quality of the tire. A dense carcass is important for low rolling resistance. At the same time, puncture protection increases because carcasses with a high strand density are difficult to puncture.

This does not apply in the case of extremely fine 127 EPI carcasses as each strand is sheer and quite vulnerable. The best compromise for low weight and resistance is around 50 to 67 EPI.

In most of our top tires we use a 67 EPI carcass. Weight and rolling resistance can be reduced even further by using a 127 EPI carcass. But at the same time, these tires are a lot more vulnerable to damage. Therefore, we intentionally use the 127 EPI carcasses only for extremely light-weight tires or in combination with extremely high-performance puncture protection materials.

Exercise caution when comparing EPI of different tire brands as it is common that the total of all carcass layers are added together. An indication of 200 TPI results from 3 layers of 67 EPI each underneath the tread. With all EPI numbers above 127, it should be assumed that the figures have been calculated by adding up the strands in all layers. Schwalbe only indicates the material density in one carcass layer. Commonly, there are 3 carcass layers underneath the tread.



Low density carcass



High density carcass

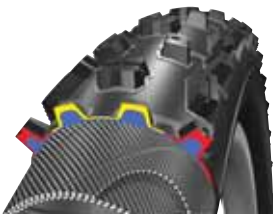
Does a perfect rubber compound exist?

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

The conflicting targets of low rolling resistance and good wet adhesion always attract particular attention. Good adhesion implies that the tire must “absorb” a lot of energy while low rolling resistance requires a rubber compound with low energy “consumption”. A good compromise is achieved with SILICA filler for example.

We offer universal compounds that, as far as possible, combine all relevant features, as well as special compounds where one feature is particularly prominent. One of the universal compounds is, for example, the Marathon ALLROUND rubber compound. On the other hand, Marathon XR's ENDURANCE compound is a rubber compound with an extreme characteristic (maximum mileage).

Triple Compound Technology is a very effective option that combines all relevant characteristics in one tire. Different rubber compounds designed for their respective strengths are used in the areas of tread shoulder, tread center and tread base. In this way, our top racing tires (e.g. Ultremo, Nobby Nic) achieve a versatility, which we did not think possible just a few years ago.



MTB tire with triple Compound

Why are reflective lines used?

Reflective lines are clearly visible when illuminated by a car headlight. The two tire-sized circles of light make a cyclist easily seen and recognized.

German Motor Vehicle Safety Standards (StVZO § 67, Abs 7) allow this as an adequate replacement for wheel reflectors.



The European approval mark certifies conformity with all legal requirements for lighting equipment (ECE – Regulations 88). That means for the REFLECTIVE lines, light refraction is sufficiently strong and bright, even at an unfavorable angle.

Because of this considerable safety advantage, we began to use reflective lines years ago as standard for all high quality touring and city tires.

Target conflict

Silica

Triple Compound

Reflective Lines

StVZO

Approval Mark

Clincher tire

What is a clincher tire?

Today clincher tires are standard for bicycles. See tire construction. The wire bundle in the tire bead prevents the tire from expanding with the pressure and thus from jumping off the rim.



Wire core



Kevlar bead

Folding tire

What is a folding tire?

A folding tire is a special version of the clincher tire. The wire bundle is replaced by a bundle of kevlar strands. This enables the tire to be folded up and depending on the tire size, makes it about 50-90 g lighter.



Marathon Racer as a Folding Tire

Tubular tire Tub

What is a tubular tire?

In a tubular tire, also called a "Tub", the tube is sewn directly into the tire. The tire is then glued onto a special rim.

Many bicycle racing professionals 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. But with regard to rolling resistance, this assumption is now outdated. Modern folding tires have closed the gap on tubular tires with regard to rolling resistance and now roll even faster.

However, a clear advantage of tubular tires lies in their run-flat capability. Even with a flat, 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.

Right now the tubular tire is experiencing a small comeback. The reason might be the possible weight saving on the wheel. Super light carbon wheels are mostly built for tubular tires. And because a tubular tire rim does not need pressure retaining sidewalls it is easier to construct. The tubular tire itself weighs approximately the same as a folding tire and its tube.

The drawback of tubular tires is fitting. Sticking the tire onto the rim with glue is much more awkward than fitting a clincher tire. Also, the tubular tire cannot be repaired as easily as a regular tire and inner tube. Smaller defects can be repaired with a puncture protection liquid. Otherwise, the tubular tire must be changed.

Also, the manufacturing process is more labour intensive. That is why top quality tubular tires are so expensive.



Ultremo Tubular tire

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. Special tires and rims are necessary. At this time 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 danger of a blowout is reduced with tubeless tires. The tires can also be operated with lower inflation pressure, which offers a better rolling resistance and grip on offroad terrain. When punctured, a catastrophic pressure loss will not be experienced and valve tear off is impossible.

It is important to note that fitting is more difficult and is significantly different from fitting traditional tires. The specific fitting instructions must be strictly observed (see chapter Fitting). The tire and the rim must be perfectly clean, especially in the contact area, in order to obtain an airtight seal.

*Tubeless System:
Airtight seal between
tire and rim.*

Why are tubeless tires only available for mountain bikes?

In offroad terrain, tubeless systems offer a clear advantage. Tires can be operated with lower inflation pressures, which improves the grip and the rolling characteristics. On the other hand, on road, a high inflation pressure is an advantage and the current tubeless system, as found in MTB's is unsuitable for high pressure. Pressures above 4 bar would blow the tire off the rim.

There have been numerous attempts to offer suitable high-pressure tubeless tires and rims for racing bikes. Such tires are very hard to fit because the tolerances of both rim and tire must be extremely accurate in order to achieve an airtight fit. Because there are no apparent advantages, we do not see much sense, nor a future, for such systems.

Tubeless UST

Tread

Aquaplaning

What does the tire tread do?

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

Unlike a car, a bicycle will not aquaplane. 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 though, 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 or dirty roads, the tread can also contribute to better control.



Smart Sam, treaded MTB tire

Slick

Why ride a slick tire?

On a normal, smooth road, even in wet conditions, 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. 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.



Ultremo, a competition tire with a plain slick tread. Frequently praised for its exceptional wet adhesion.

What do the direction arrows mean?



Most Schwalbe tire sidewalls are marked with a “ROTATION” arrow, which indicates the recommended rolling direction. When in use, the tire should run in the direction of the arrow. Older tires have the marking “DRIVE”, but it has the same meaning.

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 so many treads direction dependant?

On 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, the 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. That is why certain tires are fitted in opposite rotating directions when used as front and rear tires.

There are also treads without a specified rotating direction.



Marathon Racer, rolling direction road tread

Rolling direction

Drive

Rotation

Front

Rear

Rolling direction

Riding forces

Steering forces

Braking forces

Rolling Resistance

Air resistance

Acceleration

Gradient resistance

Friction resistance

Tire pressure

Tire diameter

What exactly is rolling resistance?

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

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

The air resistance rises in a squared ratio with increased speed. In a straight-line and at a speed of 20 km/h on level ground, air resistance has already become the main resistance force.

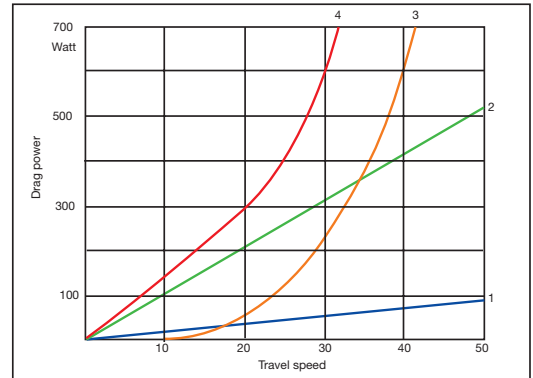
Acceleration Energy is also required to accelerate. For instance, the weight of the wheels is of great importance when this mass has to be brought up to rotation.

When riding uphill, the main resistance force to be overcome is the gradient resistance (grade 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



How important is the rolling resistance?

Of course, every bicycle tire should roll very easily. Compared to a car, cyclists have only (very restricted) physical strength at their disposal, which of course should be used as efficiently as possible.

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 tire construction.

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.

Which factors affect rolling resistance?

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

On a smooth surface the following applies: The higher the tire pressure, the less is tire deformation and thus rolling resistance.

Off road it is exactly the reverse: The lower the inflation pressure, the lower the rolling resistance. This applies equally on hard gravel roads and soft forest tracks. Explanation: A tire with low inflation pressure can adapt better to a rugged surface. It sinks into the ground less and the whole rotational mass is retarded much less by the uneven surface.

Tires with a smaller diameter have a higher rolling resistance with the same tire pressure, because tire deformation is proportionally greater. In other words the tire is "less round".

Tire width

Tire Construction

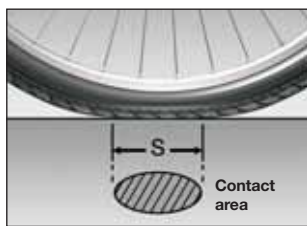
Tire tread

Wider tires roll better than narrower tires. This statement generally invokes skepticism, nevertheless, with tires at the same pressure a narrower tire deflects more and so deforms more.

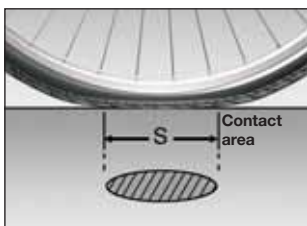
Obviously, tire construction also has an effect on rolling resistance. By using less material, less material can be deformed. And the more flexible the material is, such as the rubber compound, less energy is lost through deformation.

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

Why do wide tires roll better than narrower tires?



Wide tires



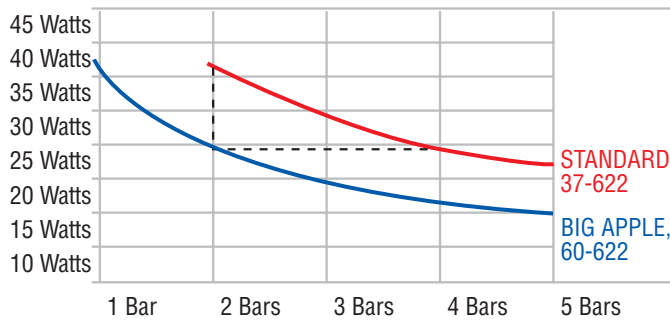
Narrow tires

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 detrimental 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 the rotation. In a wide tire, the flattened area is shorter in length and does not have so much effect on the rotation. The tire stays “rounder” and therefore it rolls better.

*Rolling resistance:
At 2 bar a 60mm wide tire rolls
as well as a 37 mm tire at 4 bar.*



Why do racing professionals use narrow tires?



Narrow tires in a race

Wide tires only roll more easily with the same inflation pressure. But narrow tires can be operated with a higher inflation pressure than wider tires. However, then they are obviously less comfortable to ride.

In addition to this, narrow tires have an advantage over wider tires 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.

But at a constant speed 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.

Contact area

Flat area

Inflation Pressure

Air resistance

Weight

Acceleration

Puncture protection belt

Correct inflation pressure

Tire Check

Internal Safety Tube + Rim Tape

Puncture protection Tape

Puncture protection liquid

Latex Tube

How can a puncture be prevented?

The best and most important protection against punctures is a high quality tire with a good puncture belt.

Maintain the correct inflation pressure. If the inflation pressure is too low, the risk of punctures is substantially higher. Check and correct the inflation pressure at least once a month with a pressure gauge.

It also helps to check the tire for embedded foreign objects and to remove them. Replace worn tires.

The best protection belt will not serve any purpose if “internal safety” is not observed. Only purchase quality tubes. The rim tape is also important. The rim tape protects the tube from mechanical damage from spoke ends, metal burrs and holes in the rim. An appropriate rim tape must completely and securely cover all spoke holes.

Puncture protection tapes can be inserted between the tire and tube at fitting. They protect from punctures but are not without problems because lying between the tire and the tube, they cause unnecessary friction. Therefore, we do not offer protection tapes separately. It is better if the protection belt is incorporated into the tire.

In certain cases the use of a puncture protection liquid is helpful (see next page).

Latex tubes are favored as a puncture protection means as well. Chapter “Tube” explains the advantages and disadvantages.



Tried and tested for more than 20 years. The Marathon with puncture protection belt



Schwalbe High Pressure Rim Tape

Which is the best puncture protection belt?

The safest bicycle tire for most purposes is our “flat-less” tire Marathon Plus. The SmartGuard belt, made out of highly elastic special rubber, is approx. 5mm thick. The decisive advantage of SmartGuard® is its effectiveness against objects that become lodged in the tread, that are rolled over at each turn of the wheel and will eventually penetrate virtually any protection belt. This is where the advantage of SmartGuard comes into effect. A thumbtack, for example, is embedded in the rubber without causing any damage.

The new “High Density Guard” works on a different principle of functionality. Using a patented weaving technology, an extremely close-meshed and dense fabric is produced. This belt is incredibly hard to puncture. No other bicycle tire features such a similar dense fabric.

With the High Density Guard, it is now possible for the first time to effectively protect very light tires from punctures. The Marathon Supreme weighs only half that of the Marathon Plus. The Ultrero racing tire weighs in at only 195 g.

Both technologies are patented.



A puncture can never be completely avoided. You are very well protected against the typical puncture demons like shards and granular material with the Marathon Plus.



Marathon Supreme. Light and Safe

Marathon Plus Flat-less

Marathon Supreme High Density Guard

How should puncture protection liquids be used?



Doc Blue – The liquid patch

Unfortunately most liquids available on the market are not very reliable.

Basically, there are two kinds of puncture protection liquids. The first kind works solely mechanically. The liquid contains small fibres or particles that will close the hole. Advantage: Such liquids can stay in the tube for an unlimited amount of time. Disadvantage: The hole is not really repaired but only plugged and it can open up again e.g. the next time, the tire is inflated. The second kind of liquid is latex based. It can be recognized by its distinct ammonia smell. When latex contacts the air, it hardens and in that way it permanently repairs the hole.

Unfortunately, these kind of liquids can only stay in the tube for a limited amount of time before they cure completely.

Our Doc Blue is also based on latex and is effective in the tube for approx. 3 months as a preventative. Additional particles in the liquid ensure that larger holes are also quickly sealed. These particles in the liquid are also the reason that the valve core must be removed for filling. Liquids, which can be filled with the valve installed, are usually extremely thin and therefore, only able to seal very small holes.

For all puncture protection liquids, the following applies: The liquid can only seal the hole when the wheel rotates. Handling can be problematic. A good, puncture protected tire is the best and simplest solution for most people.

We recommend Doc Blue mainly for tubeless systems and tubular tires. In these cases it is a useful aid as otherwise these tire types either cannot or only with great difficulty be repaired.

Furthermore, Doc Blue is suitable for preventing punctures in particularly light tires for a limited time, for example, a competition. It also makes sense as an additional protection for touring in extremely thorny areas.

In an emergency Doc Blue can repair small punctures without dismantling tube and tire. However greater damage, like cuts or Snakebites, cannot be repaired with a latex solution.

Active principles

Doc Blue

Application recommendations

Tubeless

Tubular tire

Tread

When is a tire worn out?

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.

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. Because puncture resistance also depends on the thickness of the tread layer it may be useful to replace the tire sooner.

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 pressure. Checking and adjusting the inflation pressure at least once a month with a pressure gauge is most important.



Tread is worn out. Rubber is still present. This tire can still be ridden.



The puncture protection layer can be seen. The tire must be changed urgently.

**Sidewall
Inflation Pressure**

What mileage can be achieved with various tires?

Mileage

It is difficult to answer this question, as 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 can expect a tire mileage of 2000 to 5000 km from Schwalbe standard tires.

The tires of the Marathon family usually last between 6000 and 12000 km. With the light Marathon Racer and Marathon Supreme, the performance is a little lower (approx. 5000 to 9000 km). The Marathon XR is outstanding with its extremely high mileage of approx. 8000 to 15000 km.

No useful mileage data is possible for MTB tires because the influence of riding style is too dominant.

Our racing bike tires Stelvio and Ultremo last from 3000 to 7000 km.



*Marathon XR.
The bicycle tire with the highest mileage*

Why do many tires wear prematurely?



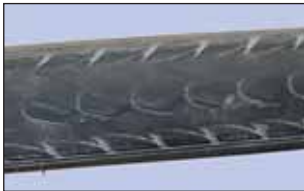
Fatigue Cracks

Unfortunately, many tires do not reach the possible mileage because they are continually ridden at inflation pressures that are too low. Insufficient inflation pressure means the tire cannot bear heavy loads. The tire flank must deform excessively when running. The tire can only stand this kind of treatment for a limited time. At some point the sidewall is overburdened and will fail.



Aging Cracks

Fig. 1 shows the typical fatigue cracks which arise from low inflation pressure. A few large cracks in the upper area of the sidewall. Compared to this, normal aging cracks are rather small and distributed evenly across the whole sidewall (due to old age and/or poor rubber compound).



These pictures also show clear symptoms of continued riding with insufficient inflation pressure.

Typical abrasion: The tire is not bald in the center but on the left and right sides.



Typical walk traces in the tire and on the tube.



How long can a tire be stored?

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

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

Tire Wear

Fatigue Cracks

Aging Cracks

Storage

Butyl

What is a bicycle tube made of?

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 extremely high air retention and elasticity. This high elasticity allows a wide range of different tire sizes to be covered.

Mould curing Autoclave curing

There is a difference between heat moulded and autoclave tubes. Vulcanizing in a mold improves the uniformity of wall thickness, thus reducing weight and improving air retention. Schwalbe tubes have always been made using the heat moulding process.

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

Which special features does a Schwalbe tube offer?

Airtightness

Besides the quality of the ingredients, the purity of the rubber compound is decisive for the quality of the tube. Before extrusion, the basic material is forced through a total of seven filters under enormous pressure. All tubes are inserted and inflated into a mold for the vulcanization process. Only this ensures an even wall thickness and high air retention.

Dependability

All tubes are inflated and stored for 24 hours to test for air retention. Afterwards, every tube is carefully checked individually by visual inspection. The special quality control which prevents unpleasant surprises. The Schwalbe tube has been valued by German bicycle dealers for its high reliability for many years.

Group tube system

A tube covers many tire sizes through its high elasticity and quality. Tube no. 17 works with tires from a width of 28 mm up to 47 mm. A great advantage for stock-holding in the trade. At the same time, it is proof of the quality of the tube.

Only an extremely high-quality and reliable tube is equal to these demands.

Valve

All valves are nickel-plated and threaded. The valve core is always replaceable. Also, Schwalbe tubes with a classic bicycle valve can be inspected for pressure as they have a high-pressure valve core. As an external indicator, every tube has a stylish dust cap made out of transparent polycarbonate.

The Schwalbe tube is the only tube which carries the "VSF all ride" quality stamp. VSF is an association of particularly dedicated and quality-oriented German bicycle dealers.



www.vsf-guetesiegel.de

What are the advantages of latex tubes?

Tubes made out of latex are more elastic than normal butyl tubes. This makes them roll a little more easily. Their greatest advantage lies in the high level of puncture protection. The highly elastic latex material is very difficult to puncture.

The disadvantage lies in poor air retention. A tire with a latex tube must be adjusted for inflation pressure before every trip. This explains why latex tubes are not well suited for everyday use.

In addition, latex tubes are very delicate and susceptible to oil, daylight, heat and uneven expansion. The tube must also be replaced every time a tire is changed. Because these sensitivities lead to many problems in the field, we do not offer latex tubes.

However, there is one exception: Latex tubes are sewn-in to our high-quality tubular tires. Here, the tube can only expand in an evenly round way. It cannot come into contact with oily fingers, sunlight or with hot rims from braking. Therefore, the advantages of a latex tube can be safely and appropriately used in this circumstance.

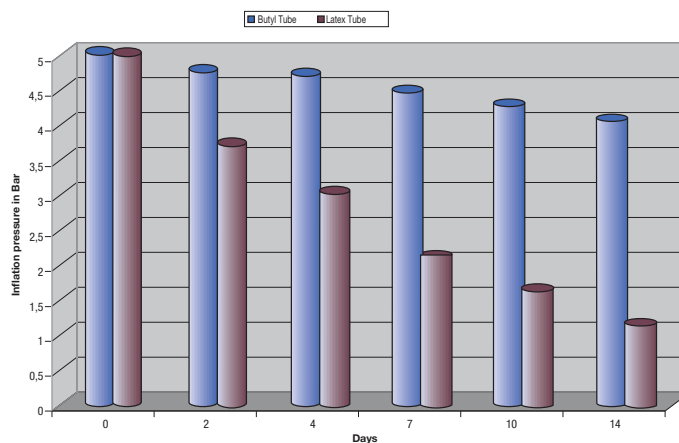
Free running

Puncture Resistance

Air Retention

Tubular tire

Comparison of air retention



Traditional bicycle valve
Dunlop valve
Easy pump Valve "Blitzventil"

Sclaverand valve
Presta valve
French valve
Racing bicycle valve

Auto/Car valve
Schrader valve
Regina valve
Italian valve

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 case, all Schwalbe valves provide excellent performance and are adapted to high-pressure use.

The classical bicycle valve or Dunlop valve is still the most common worldwide. Most cyclists are familiar with it. The valve core can easily be replaced and 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 valve allows a return airflow, so that it is now possible to check the inflation pressure with an Airmax Pro pressure gauge.

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

A Sclaverand valve is narrower than other valves (6 instead of 8 mm). It needs a smaller rim hole and is therefore particularly well suited for narrow racing bike rims. It is also 4 - 5 g lighter than a car valve or Dunlop valve.

It can be locked manually with the knurled nut. Before inflating, the knurled nut must be loosened. First time users frequently have some problems. Also the thin top pin can be easily bent when attaching and removing the pump connector.

Caution: Be aware that using Sclaverand valve tubes on rims with larger valve holes often leads to valves shearing when the sharp metal edges around the valve hole cuts the valve stem off the tube.

The Auto/Car valve is becoming more and more popular. It can be inflated very easily at a filling station and is pleasantly unproblematic. Older, as well as simple bicycle pumps are not compatible with Auto/Car valves.

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



Traditional bicycle valve



Sclaverand valve



Auto/Car valve



Regina valve

What is the purpose of a rim nut?

The rim nut fixes the valve into the rim. Some regard it as unnecessary. Indeed, a bicycle can be ridden perfectly safely without a rim nut. It is however helpful when attaching the pump connector, as particularly when the pressure is low the valve may fall inside the rim. With some rims there may be a rattle if the valve is not fixed.

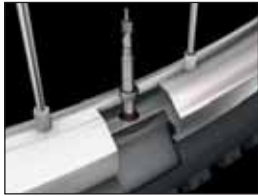
The rim nut must only be tightened by hand. Never tighten the rim nut with pliers, as this can lead to tube damage.



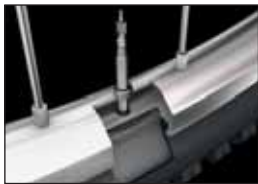
What causes valve tear off?



Torn valve stem



Too large inner valve hole



Correct size inner valve hole

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

Another frequent cause is installing a Schwalbe 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.

Caution: Be aware that there are also rims 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.

A nut that is excessively tightened 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.

Torn off valves are often seen on mountain bikes. Continual improvement in brake performance and low inflation pressures often cause the tire to slip on the rim. The tire movement then drags the tube and this can lead to the valve shearing off.

What can be done to prevent tire slip or valve tear off?

A higher inflation pressure considerably reduces the tire moving. Of course a higher tire pressure is not always desired.

We implement Limited Slip Technology (LST) in Schwalbe MTB-folding and balloon tires. The tire bead is coated with a special rubber layer that produces a dramatic reduction in tire/rim slip.

The Schwalbe Downhill tube has a highly reinforced valve foot.

Theoretically, the use of talcum powder is also helpful. This can reduce the friction between tire and tube so that the tire no longer moves the tube along with it. However in practice, if talcum powder gets between tire and rim, it will increase the problem.

Some rims have such slippery surfaces that even LST does not suffice one hundred percent. It will help if the rim contact area with the tire is lightly abraded with sandpaper (180 grade). To considerably increase the friction between tire and rim it is sufficient just to remove the very smooth surface coating (Eloxal, varnish etc.).

The problem is very much reduced with disc brakes because the rims do not get hot through braking.

There is no valve tear off with tubeless tires. The tire can move without causing problems.



Schwalbe tire with L.S.T. coating on the bead

Valve tear off

Valve hole

Tire slip

Inflation Pressure

Limited Slip Technology

Downhill Tube

Talcum

Roughening the rim

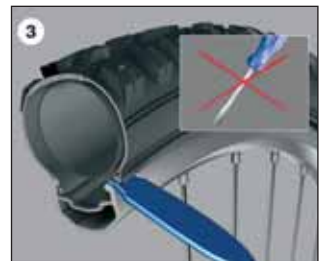
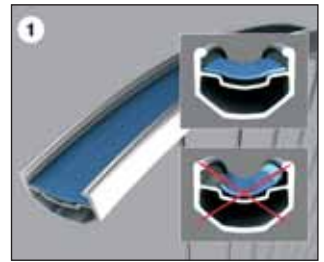
Disc brake

Tubeless

Fitting instructions

How is a bicycle tire fitted?

- An appropriate rim tape must completely and securely cover all spoke holes (fig. 1).
- Observe any rotation direction markings on the tire sidewall.
- Fit one side of the tire onto the rim.
- 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).
- Never use sharp fitting tools (fig. 3).
- Starting opposite the valve mount the other tire side onto the rim.
- Ensure the tube is not pinched between the rim and the tire (fig. 4).
- The valve should be in an upright position (fig. 5).
- Center the tire before inflating it to the required pressure.
- Adjust the inflation pressure using a pressure gauge, e.g. the Schwalbe Airmax Pro pressure gauge. The permitted inflation pressure range is marked on the tire sidewall.
- Check the tire pressure at least once per month with an air gauge (fig. 6).



Why is it sometimes so difficult to fit a tire?

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

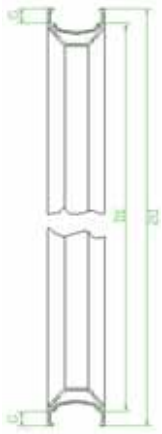
Rims may have a tolerance in diameter of +/- 0,5 mm. In addition, the height of the rim flank also may have a tolerance of +/- 0,5 mm. This adds up to a complete tolerance of +/- 1,55 in the outside diameter, or of +/- 4,7 mm in the outer circumference. This corresponds to a maximum possible circumferential difference of 9.4 mm between the largest and the smallest rim.

A tire must fit on both extremes. Because a safe fit must 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.

The Marathon Plus has proven to be extremely difficult to fit, particularly in the very narrow version. Through the rigidity of the tire, the tire slips repeatedly from the drop-center and it is extremely hard to pull the last piece of the tire over the rim flange.

A third hand, holding the tire tight in the drop-center on the opposite side, is very helpful here. Instead of a "third hand", a zip tie or an old pedal strap can help keep the tire firmly in the drop-center during fitting.



ETRTO tolerances of crotchet type rims:

- D1 Bead Seat diameter
 $\pm 0,5$ mm
- G Rim flank height
 $\pm 0,5$ mm
- D2 Rim outer diameter,
 $D1 + 2 \times G = \pm 1,5$ mm
- U Rim Circumference,
 $D2 \times \pi = \pm 4,71$ mm



A zip tie as the helping third hand.

What can be done, if the tire cannot be centered?

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.

Our assembly fluid, Easy Fit, can be easily applied to the tire by use of the sponge applicator and without using extra tools or dirtying fingers. When inflating, the tire bead then glides easily into the right position on the rim. After approx. 10 minutes the liquid evaporates completely.

When the rim diameter is at minimum and the tire diameter at maximum, the tire cannot be seated properly regardless of the tire pressure. This situation can generally be addressed by centring 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



Easy Fit with practical sponge applicator.

Fitting difficulties

Manufacturing tolerances

Marathon Plus

Fitting aids

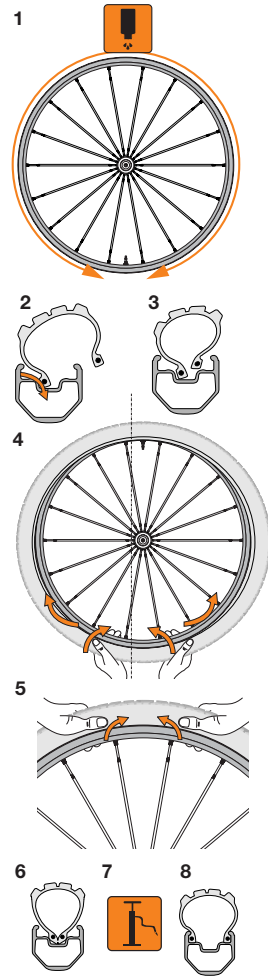
Easy Fit

Fitting a tubeless tire
UST

How is a tubeless tire 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. Start at the opposite side the valve (3) (4).
- Ensure 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 tire pressure to your requirements. Observe the pressure limits on the tire and the rim manufacturer's recommendations.

Fitting

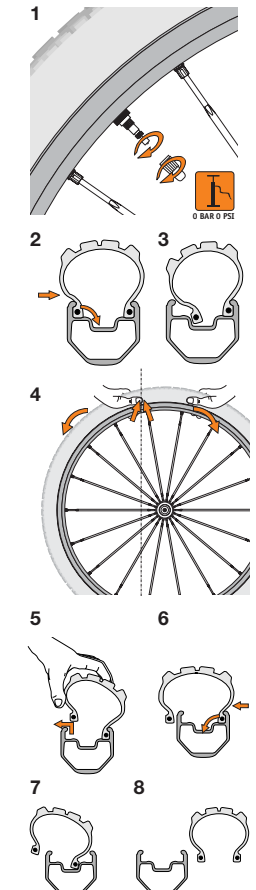


Removing a tubeless tire
UST

How is a tubeless tire removed?

- Deflate the tire (1).
- 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).

Removal



Patch Tube

How is a tubeless tire repaired?

Many Tubeless tires have an airtight coating on the inside. They can be repaired from the inside with a conventional tube patch. But because the hole can often be hard to find, it is recommended to insert a standard tube to repair a roadside puncture. In order to fit a tube, the valve first must be removed from the rim.

With extremely light tubeless tires the airtight coating is integrated on the outside of the normal rubber compound (e.g. Schwalbe Evo-Tubeless). A repair with patches is not possible in this case.

Another possibility to repair a tubeless tire is a latex based puncture protection liquid, such as Schwalbe's Doc Blue. 50 ml of this liquid will reliably seal all punctures. Leaks will automatically be sealed by the liquid and at the same time it prevents further punctures for approx. 3 months.

Puncture protection liquid

How is a tubular tire fitted?



1



2



3



4



5



6



7



8

Attention: Tubular tires should be professionally fixed to rims using special contact cement!

As a test, first fit the tire without the contact cement (4-8). Check the valve length, using an extender if necessary. Recommendation: Fitting the tire on the rim beforehand using light pressure facilitates later permanent fixing.

Tire: Evenly coat the protective tape with a layer of contact cement (3) and let it dry for at least 6 hours.

New rim: Remove grease and if necessary roughen the rim well with fine sandpaper (1). Follow the rim manufacturer's instructions! Evenly apply a layer of contact cement to the rim and let it dry for at least 6 hours! (2).

Used rim: Examine the existing contact cement layer. An even and intact contact cement layer can be re-used. If the layer is very uneven, completely remove all remnants of the contact cement from the rim and apply new cement.

Apply a fresh layer of contact cement to the rim (2). Immediately fit the tire. Insert the valve. Pull the tire as firmly as possible, so that the final section of tire slips over the edge of the rim in an easy and controlled manner (4-7). Slightly inflate the tire and center its position. The edge of the protective tape serves as orientation (8). Inflate to approx. 9 Bar and push down on the whole of the tire's circumference using your full bodyweight. Clean off any remnants of contact cement from the rim braking surface.

Important: Leave the assembly to rest under pressure for at least 24 hours! Check tires regularly. Never ride on tires with a damaged or loose protective tape.

Preparation 1

Preparation 2

Fitting

Load Capacity
 Rolling Resistance
 Tire Wear
 Suspension

Why is inflation pressure so important in bicycle tires?

Only tires with sufficient inflation pressure can bear the weight of a bicycle. The following applies for the road: The higher the inflation pressure the lower the rolling resistance of the tire. The susceptibility to punctures is also lower with high pressure.

If the inflation pressure is continuously too low, premature tire wear is the result. Cracking of the sidewall is the typical consequence. Abrasion is also unnecessarily high.

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

Wide tires are generally used at low pressure. The larger air volume is advantageous in that it absorbs road bumps and holes, but does not suffer from higher rolling resistance, less puncture protection or low tire wear.

Sidewall wear



Constant use at 1.5 bar



Constant use at 4.5 bar

Control
 Pressure gauge
 Track Pump
 Filling Station

How often should tire pressures be checked?

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 much thinner. A pressure loss of 1 bar per month can be viewed as normal, but pressure loss will be much faster with high inflation pressures and much slower with low inflation pressures.

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

Use a pressure gauge to monitor the inflation pressure. The widespread thumb-test method is very inaccurate, as all tires will feel identically hard from a pressure of 2 bar up. The thumb test is completely insufficient for Marathon Plus tires due to the special puncture belt.

Our air gauge Airmax is suitable as a testing instrument. With the correct valve or a small adapter, inflation pressures can be tested and adjusted at a gas station. The purchase of a track pump with an air gauge is recommended for all active cyclists.



Inflation pressure check with the Airmax Pro.

What is the correct pressure for my tire?

Tire width	Inflation pressure-Recommendation:	
20 mm	9,0 bar	130 psi
23 mm	8,0 bar	115 psi
25 mm	7,0 bar	100 psi
28 mm	6,0 bar	85 psi
30 mm	5,5 bar	80 psi
32 mm	5,0 bar	70 psi
35 mm	4,5 bar	65 psi
37 mm	4,5 bar	65 psi
40 mm	4,0 bar	55 psi
42 mm	4,0 bar	55 psi
44 mm	3,5 bar	50 psi
47 mm	3,5 bar	50 psi
50 mm	3,0 bar	45 psi
54 mm	2,5 bar	35 psi
57 mm	2,2 bar	32 psi
60 mm	2,0 bar	30 psi

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 regards to low rolling resistance or suspension comfort.

The permitted inflation pressure range is marked on the tire sidewall. The higher the inflation pressure, the lower the rolling resistance, the tire wear and the less 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 the rider is heavier or carries luggage, a higher inflation pressure should be used. For each additional kilogram that the tire must carry (bike, rider, luggage), the inflation pressure should be increased by approx. 1%. It is recommended that higher inflation pressures are used on very small diameter tires such as recumbants and folding bikes.

Lighter weight riders or riders who prefer a smooth or more comfortable ride can accordingly choose a 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.



That's how it should look.
The tire is hardly deformed under the weight of the rider.



That's how it shouldn't look.
The inflation pressure is far too low here.

Weight

Tire width

Individual preferences

Recommended inflation pressure

Hollow section rim

High pressure rim tape

Rubber rim tape

Fabric rim tape

What does a rim tape do?

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?

An appropriate rim tape must completely and securely cover all spoke holes.

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

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.

On the following page we have recommended the optimum rim tape size for the most common rims on the market.

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 sided cycle rims, which are often used on MTB and trekking bikes.



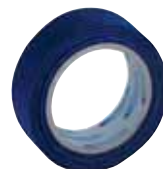
The complete rim well is covered. The rim tape cannot move.



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



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



SCHWALBE fabric rim tape.

Why doesn't Schwalbe offer a 12 mm high pressure 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.

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



A 12 mm tape is too narrow and not safe.



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

12 mm rim tape

Rim		Super HP Rim Tape		
Alesa				
20"	Columbia R	406 x 19	22-406	
	X-Plorer	406 x 19	22-406	
26"	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	
	28"	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	
Alex				
18"		DV15	355 x 16	18-355
26"	DA16	622 x 16	20-622	
	DP17 Disc	622 x 17	22-622	
Ambrosio				
26"	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	
	Keba	559 x 18	22-559	
	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	
	28"	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	
DT Swiss				
26"	FR 6.1D	559 x 25	25-559	
	EX 5.1 D	559 x 21	25-559	
	XR 4.1	559 x 17	20-559	
	XR 4.1c	559 x 17	20-559	
	XR 4.1d	559 x 17	20-559	
	XR 4.2d	559 x 18	22-559	
	XRC330	559 x 17	20-559	
	X 430	559 x 18	22-559	
	X 450	559 x 17	20-559	
	X 455	559 x 17	20-559	

Rim		Super HP Rim Tape		
	X 470	559 x 18	22-559	
	E 540	559 x 22	25-559	
	28"	RR 1.1	622 x 15	16-622
		RR 1.2	622 x 15	16-622
		R520	622 x 15	16-622
TK 7.1		622 x 19	22-622	
TK 7.1d		622 x 19	22-622	
Exal				
26"	LX17	559 x 17	18-559/571	
	MX19	559 x 19	22-559	
	SP19	559 x 19	22-559	
	XL25	559 x 25	25-559	
	XP19	559 x 19	22-559	
	ZX19	559 x 19	22-559	
	CL19	559 x 19	22-559	
	XX19	559 x 19	22-559	
	TX19	559 x 19	22-559	
	28"	CL19	622 x 19	22-622
BX17		622 x 17	18-622	
KM 19 (Koga Miyata)		622 x 19	22-622	
LX17		622 x 17	18-622	
ML21		622 x 21	25-622	
MX19		622 x 19	22-622	
SP19		622 x 19	22-622	
TX19		622 x 19	22-622	
XL25		622 x 25	16-622	
XP19		622 x 19	22-622	
XR1 Aero		622 x 13	18-622	
XR2		622 x 13	16-622	
XR3 Aero		622 x 13	16-622	
XX19		622 x 19	22-622	
ZX19		622 x 19	22-622	
Fir				
26"	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	
	28"	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	
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				
16"	Dynamic 4	305 x 19	22-305	
20"	Dynamic 4	406 x 19	22-406	
	Dynamic 4	406 x 21	14-406	
	Dynamic 5	406 x 19	22-406	
	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	

Rim		Super HP Rim Tape
	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
24"	Dynamic 3	507 x 19 22-507
	Dynamic 4	507 x 19 22-507
	Dynamic 4	507 x 21 14-507
	Pro Disc 1	507 x 21 22-507
	Pro Disc 2	507 x 21 22-507
	Pro Disc 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
26"	Dynamic	559 x 19 22-559
	Dynamic 2	559 x 21 25-559
	Dynamic 3	559 x 15 20-559
	Dynamic 3	559 x 19 22-559
	Dynamic 4	559 x 19 22-559
	Dynamic 4	559 x 21 14-559
	Dynamic 6	559 x 19 22-559
	O'Connor Disc 2 Disc Runner	559 x 21 25-559
	Pro Disc 1	559 x 21 25-559
	Pro Disc 2	559 x 21 25-559
	Pro Disc 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
28"	HK Dynamic 1	622 x 19 22-622
	Dynamic 3	622 x 19 22-622
	Dynamic 4	622 x 19 22-622
	Dynamic 4	622 x 21 14-622
	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

20"	Xx	406 x 21 22-406
26"	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
	2.30 Disc	559 x 19 22-559
	D 521	559 x 21 25-559
	EN521 disc	559 x 21 25-559
	EN321 disc	559 x 21 25-559
	EX729 disc	559 x 29 32-559
	EX721	559 x 21 25-559
	EX325 disc	559 x 25 25-559
	F 519	559 x 19 22-559
	MX Disc	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

Rim		Super HP Rim Tape
	XC717	559 x 17 20-559
	XC717 disc	559 x 17 20-559
	XM517	559 x 17 20-559
	XM317	559 x 17 20-559
	XM317 disc	559 x 17 20-559
	XM117	559 x 17 20-559
	XM117disc	559 x 17 20-559
	XM719	559 x 19 22-559
	XM719 disc	559 x 19 22-559
	CXP 12	571 x 13 18-571
	CXP 14	571 x 13 16-571
	CXP 22	571 x 15 18-571
	CXP 33	571 x 13 18-571
	Open Pro	571 x 13 18-571
28"	Axcell	622 x 14,5 18-622
	CXP 10	622 x 13 16-622
	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 22	622 x 15 18-622
	CXP 23	622 x 15 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
	Mach1	622 x 19C 20-622
	Open 20/Open 20D	622 x 13 18-622
	Open Pro	622 x 13 18-622
	Open Sport	622 x 15 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
	A719	622 x 19 22-622
	A317 Disc	622 x 17 20-622
	A319	622 x 19 22-622
	A119	622 x 19 22-622
	TN719	559 x 19 22-622

Rigida

20"	Laser	406 x 19 22-406
	X-Plorer	406 x 19 22-406
24"	Laser	507 x 19 22-507
26"	Aries, Aries R	559 x 17 20-559
	Andra	559 x 19 22-559
	Andra 20	559 x 19 22-559
	Andra 30	559 x 19 22-559
	DH 30 (Downhill)	559 x 30 32-559
	Disc Bull	559 x 23 32-559
	DP 22, DP 2 R	559 x 16 20-559
	DP 25	559 x 16 22-559
	DP 2000	559 x 19 22-559
	Griffin DiscBrake	559 x 19 22-559
	Grizzly	559 x 18 20-559
	Grizzly	559 x 19 22-559
	Laser	559 x 19 20-559
	Libra	559 x 19 22-559
	Mensa	559 x 21 25-559
	Matrix	559 x 19 22-559
	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
	Sphinx	559 x 17 20-559
	Sphinx R	559 x 17 20-622
	Sputnik	559 x 19 22-559
	Star 17	559 x 17 20-559
	Stratos	559 x 19 22-559
	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
	Twister 5 Safety Line	559 x 19 25-559
	Twister 5 Off Set Safety Line	559 x 19 25-559

Rim		Super HP Rim Tape
	Ultimate Power	559 x 17 20-559
	XC 420	559 x 17 20-559
	X-Plorer	559 x 19 22-559
	X Star 19	559 x 19 22-559
	X Pace	559 x 19 22-559
	Zac19	559 x 19 22-559
	Zac 19 R	559 x 19 22-559
	Zac21	559 x 21 14-559
	Zac2000	559 x 19 22-559
	Zenith	559 x 13 18-559/571
	DP 18, DP 18 R	571 x 13 16-571
	DPX	571 x 13 16-571
	Nova, Nova R	571 x 13 16-571
28"	Aries R	622 x 17 20-622
	Andra	622 x 19 22-622
	Andra 20	622 x 19 22-622
	Andra 30	622 x 19 22-622
	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
	DP 2000	622 x 19 22-622
	DPX	622 x 13 16-622
	Excel	622 x 13 16-622
	Flyer Safety Line	622 x 13 16-622
	Laser	622 x 19 20-622
	Grizzly	622 x 19 22-622
	Libra, Libra R	622 x 19 22-622
	Matrix	622 x 19 22-622
	Mensa	622 x 21 25-622
	Mystral 5 Safety Line	622 x 19 25-622
	Mystral 5 Off Set Safety Line	622 x 19 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
	Sphinx	622 x 17 20-622
	Sphinx R	622 x 17 20-622
	Sputnik	622 x 19 22-622
	Star 17 Safety Line	622 x 17 20-622
	Star 19 Safety Line	622 x 19 22-622
	Stratos	622 x 19 22-622
	Taurus2000 DiscBrake	622 x 19 22-622
	Vela	622 x 13 16-622
	Xipple 5 Safety Line	622 x 13 16-622
	X-Plorer	622 x 19 22-622
	Zac19	622 x 19 22-622
	X Star 19	622 x 19 22-622
	X Pace	622 x 19 22-622
	Zac 19 R	622 x 19 22-622
	Zac21	622 x 21 14-622
	Zac2000	622 x 19 22-622
	Zenith	622 x 13 18-622

Rodi

20"	Airline	406 x 21 22-406
	Air Line 1	406 x 21 22-406
24"	Air Line 1	507 x 21 22-507
26"	Airline One	559 x 19 22-559
	Air Line 1	559 x 19 25-559
	Air Line 1	559 x 21 25-559
	Air Line 3	559 x 21 25-559
	Airline cre	559 x 21 25-559
	Freeride FR Disc	559 x 21 25-559
	Freeway	559 x 19 22-559
	Tempest	559 x 20 22-559
	Typhoon	559 x 19 25-559
	Vision	559 x 19 22-559
28"	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
	Airline One	622 x 19 22-622
	Airline cre	622 x 19 22-622
	Black Jack Evo	622 x 13 16-622
	Freeway	622 x 19 22-622
	Kronos Racing	622 x 13 16-622
	Stylus Racing	622 x 13 18-622
	Tempest	622 x 20 22-622
	Vision	622 x 19 22-622
	Typhoon	622 x 19 25-622

Rim		Super HP Rim Tape
Schürmann		
20"	Alpha 19	406 x 19 22-406
	City Reflex	406 x 19 22-406
	Double Master Reflex	406 x 19 22-406
	Euro Line 19	406 x 19 22-406
	Euro Reflex 19	406 x 19 22-406
	Starline Reflex 19	406 x 19 22-406
	Yak 19	406 x 19 22-406
24"	Alpha 19	507 x 19 22-406
	City Reflex	507 x 19 22-507
	Double Master Reflex	507 x 19 22-507
	Double Master Tour 17	507 x 17 20-507
	Euro Line 19	507 x 19 22-507
	Euro Reflex 19	507 x 19 22-507
	Starline Reflex 19	507 x 19 22-507
	Yak 19	507 x 19 22-507
26"	Alpha 19	559 x 19 22-559
	City Reflex	559 x 19 22-559
	Double Master Reflex	559 x 19 22-559
	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
	Double Master Tour RS	559 x 17 22-559
	Downhill 25	559 x 25 25-559
	Euro Disc S17	559 x 17 22-559
	Euro Line 19	559 x 19 22-559
	Euro Reflex 19	559 x 19 22-559
	Jetline Reflex	559 x 19 22-559
	Starline Reflex	559 x 19 22-559
	Yak 19	559 x 19 22-559
28"	Alpha 19	622 x 19 22-622
	City Reflex	622 x 19 22-622
	Double Master Reflex	622 x 19 22-622
	Double Master Sprint 19	622 x 19 22-622
	Double Master Star	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 Tour RS	622 x 17 22-622
	Double Master Ultra 17	622 x 17 20-622
	Downhill	622 x 25 16-622
	Euro Disc S17	622 x 17 22-622
	Euro Line 19	622 x 19 22-622
	Euro Reflex 19	622 x 19 22-622
	Jetline Reflex	622 x 19 22-622
	Starline Reflex 19	622 x 19 22-622
	Yak 19	622 x 19 22-622

Sun Rims

24"	Double Track SL1 Disc Brake Only	507 x 29,4 32-507
26"	Rhyno Lite	559 x 27 25-559
	Double Track SL1 Disc Brake Only	559 x 29,4 32-559
	MTX	559 x 25,6 32-559
	Single Track Disk Brake Only	559 x 25,2 25-559
	DS2+XC	559 x 17,4 20-559

Sun Ringle

26"	Equalizer 21	559 x 16 18-559/571
	Equalizer 23	559 x 16 20-559
	Equalizer 27	559 x 19,5 25-559
	Equalizer 29	559 x 22 25-559
	Equalizer 31	559 x 23 25-559
	UFO	559 x 16 20-559

Vuelta

26"	Airline 1 Crosser XRP	559 x 21 25-559
	Airline 3	559 x 19 22-559
	Airline 5	559 x 19 22-559
	Tempest	559 x 19 22-559
28"	Airline One	622 x 19 22-622
	Typhoon	622 x 17 20-622
	Typhoon	622 x 19 25-622

Weinmann

20"	USA	406 x 18 22-406
26"	Zac19	559 x 19 22-559
	Zac2000	559 x 19 22-559
28"	Zac19	622 x 19 22-622
	Zac2000	622 x 19 22-6220

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