

Which Size Tire Fits Which Size Rim?

Bicycle tires come in a bewildering variety of sizes. To make matters worse, in the early days of cycling, every country that manufactured bicycles developed its own system of marking the sizes. These different national sizing schemes created a situation in which the same size tire would be known by different numbers in different countries. Even worse, different-sized tires that were not interchangeable with one another were often marked with the same numbers!

This page covers sizes in common use as of its writing, and a number of older sizes. *Sutherland's Handbook for Bicycle Mechanics*, 3rd through 6th edition, covers dozens of additional, antique sizes. The 6th edition is available on CD ROM from [Sutherland's](#). Better bike shops will have a copy.

Traditional Sizing Systems

The traditional sizing systems are based on a measurement of the outside diameter of a tire. This would usually be measured in inches (26", 27", etc.) or millimeters (650, 700, etc.).

Unfortunately, evolution of tires and rims has made these measurements lose contact with reality. Here's how it works: Let's start with the 26 x 2.125 size that became popular on heavyweight "balloon tire" bikes in the late '30's and still remains common on "beach cruiser" bikes. This size tire is very close to 26 inches in actual diameter. Some riders, however were dissatisfied with these tires, and wanted something a bit lighter and faster. The industry responded by making "middleweight" tires, marked 26 x 1.75 to fit the same rims. Although they are still called "26 inch", these tires are actually 25 5/8", not 26". This same rim size was adopted by the early pioneers of west-coast "klunkers", and became the standard for mountain bikes. Due to the appetite of the market, you can get tires as narrow as 25 mm to fit these rims, so you wind up with a "26 inch" tire that is more like 24 7/8" in actual diameter!

A second number or letter code would indicate the width of the tire. (26 x 1.75, 27 x 1 1/4...650B, 700C...)

Does Point Seven Five Equal Three Quarters?

Note that the inch-based designations sometimes express the width in a [decimal](#) (26 x 1.75) and sometimes as a common [fraction](#) (26 x 1 3/4). This is the most common cause of mismatches. Although these size designations are mathematically equal, they refer to different size tires, which are NOT interchangeable. It is dangerous to generalize when talking about tire sizing, but I would confidently state the following:

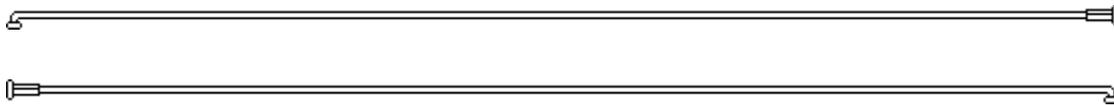
Brown's Law Of Tire Sizing:

If two tires are marked with sizes that are mathematically equal, but one is expressed as a [decimal](#) and the other as a [fraction](#), these two tires will **not** be interchangeable.

Dishonesty in Sizing

Competitive pressures have often led to inaccuracy in width measurement. Here's how it works: Suppose you are in the market for a high performance 700 x 25 tire; you might reasonably investigate catalogues and advertisements to try to find the lightest 700-25 available. If the Pepsi Tire Company and the Coke Tire Company had tires of equal quality and technology, but the Pepsi 700-25 was actually a 700-24 marked as a 25, the Pepsi tire would be lighter than the accurately-marked Coke 700-25. This would put them at a competitive advantage. In self defense, Coke would retaliate by marketing an even lighter 700-23 labeled as a 700-25.

This scenario prevailed throughout the '70's and '80's. The situation got so out-of-hand that cooler heads have prevailed, and there is a strong (but not universal) trend toward accurate width measurements.



B.S.D.

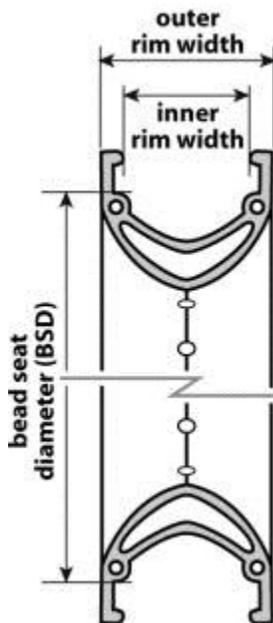


Illustration: C.J.Patten

ISO, the [International Organization for Standardization](#) has developed a universal tire sizing system that eliminates this confusion. (This system was formerly known as the "E.T.R.T.O." system, developed by the [European Tyre and Rim Technical Organisation](#).)

The ISO system uses two numbers; the first is the width of the tire or rim in millimeters (The actual tire width will vary a bit depending on the width of the rim. The rim width is the inner width measured between the flanges as shown in the diagram.)

The second ISO number is the critical one, it is the diameter of the bead seat of the rim, in mm ("B.S.D."). Generally, if this number matches, the tire involved will fit onto the rim; if it doesn't match, the tire won't fit.

For example, a 700 x 20 C road tire would be a 20-622; a 700 x 38 hybrid tire would be a 38-622. [The width difference between these sizes would make them less-than ideal replacements for one another](#), but any rim that could fit one of them would work after a fashion with the other.

A general guideline is that the tire width should be between 1.45/2.0 x the inner rim width.

If you flatten out a tire and measure the total width from bead to bead, it should be approximately 2.5 x the ISO width.

If your tire is too narrow for the rim there's an increased risk of tire/rim damage from road hazards.

If its too wide for the rim, there's an increase risk of sidewall wear from brake shoes, and a greater risk of loss of control in the event of a sudden flat.

The following is a partial listing of traditional tire sizes, with their ISO bead seat equivalents. The ISO comparison list at the bottom of this page covers all sizes which we know to be in production as of 2016. The fractional, decimal and French lists cover common sizes.

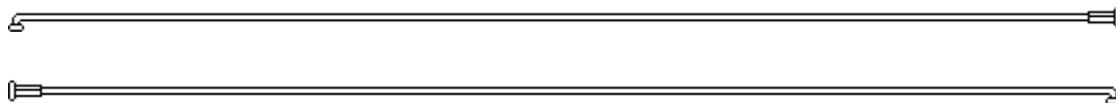
Fractional sizes:

Fractional	ISO	Applications
36 inch	787 mm	Unicycles, some novelty bicycles
32 inch	686 mm	Unicycles, some novelty bicycles
29 inch	622 mm	This is a marketing term for wide 622 mm ("700C") tires.
28 x 1 1/2	635 mm	English, Dutch, Chinese, Indian Rod-brake roadsters (Also marked F10, F25, 700 B) (F.13) Rare Canadian designation
28 x 1 5/8 x 1 1/4	622 mm	Northern European designation for the 622 mm (700 C) size
27 x anything except "27 five" and 609 mm Dutch	630 mm	Older road bikes .
26 x 1 (650 C)	571 mm	Triathlon, time trial, small road bikes. Old Schwinn S-4
26 x 1 1/4	597 mm	Older British sport & club bikes

26 x 1 3/8 (S-6)		Schwinn "lightweights"
26 x 1 3/8 (E.A.3)	590 mm	Most English 3-speeds , department-store or juvenile 10 speeds
26 x 1 1/2 (650B)	584 mm	French utility, tandem and loaded-touring bikes, a very few Raleigh (U.S.) & Schwinn mountain bikes.
26 x 1 3/4 (S-7)	571 mm	Schwinn cruisers
26 x 1, 1 1/8		High performance wheels for smaller riders, common on Cannondale bicycles
24 x 1	520 mm	High performance wheels for smaller riders; Terry front
24 x 1 1/8	520 mm or 540 mm!	Caveat emptor
24 x 1 1/4		British or Schwinn Juvenile
24 x 1 3/8 (S-5)	547 mm	Schwinn Juvenile lightweights
24 x 1 3/8 (E-5)	540 mm	British Juvenile, most wheelchairs; common on women's utility bicycles in Japan.
20 x 1 1/8		Juvenile lightweights , BMX for light riders, some recumbents, some folding bicycles
20 x 1 1/4	451 mm	
20 x 1 3/8		
20 x 1 3/4	419 mm	Schwinn juvenile
18 x 1 3/8	400 mm	British juvenile
17 x 1 1/4	369 mm	Alex Moulton AM series
16 x 1 3/8	349 mm	Older Moulton; Brompton & other folders, recumbent front, juvenile
16 x 1 3/8	337 mm	Mystery tire
16 x 1 3/8	335 mm	Polish juvenile
16 x 1 3/4	317 mm	Schwinn Juvenile
12 1/2 x anything	203 mm	Juvenile, scooters
10 x 2	152 mm	Wheelchair caster
8 x 1 1/4	137 mm	Wheelchair caster

Traditionally, fractional sizes are made for straight-sided rims.

High-performance sizes (520 mm, 571, 622 mm etc.) are preferably used with hook-edge rims, which can hold higher pressure and center the tires more reliably.



Decimal sizes:

Decimal	ISO	Applications
29 inch		This is a marketing term for wide 622 mm ("700c") tires.
28 x decimal	622 mm	Some German tire companies use this non-standard designation for 622 mm ("700c") tires.
"27 five" (meaning 27.5)	584 mm	Marketing term for wide, knobby 584 mm tires. Some Mountain bikes
26 x 1.00 through 5.0	559 mm	Most Mountain bikes , cruisers , fatbikes etc. Old Schwinn designation was S-2
26 x 1.25 (rare)	599 mm	Very old U.S. lightweights
26 x 1.375		Very old U.S. lightweights
24 x 1.5-24 x 2.125	507 mm	Juvenile mountain bikes, cruisers
22 x 1.75, 22 x 2.125	457 mm	Juvenile
20 x 1.5-20 x 2.125	406 mm	Most BMX , juvenile, folders, trailers, some recumbents
18 x 1.5		Birdy folding bikes
18 x 1.75-18 x 2.125	355 mm	Juvenile
16 x 1.75-16 x 2.125	305 mm	Juvenile, folders, trailers, some recumbents

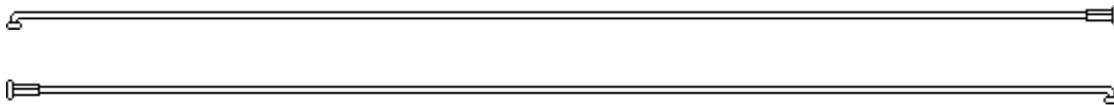
French sizes:

In the French system, the first number is the nominal diameter in mm, followed by a letter code for the width: "A" is narrow, "D" is wide. The letter codes no longer correspond to the tire width, since narrow tires are often made for rim sizes that originally took wide tires; for example, 700 C was originally a wide size, but now is available in very narrow widths, with actual diameters as small as 660 mm.



French Size	ISO	Applications
700 A	642 mm	Obsolete
700 B	635 mm	Rod-brake roadsters .
700 C	622 mm	Road bikes, hybrids, "29 inch" MTBs. (28 x 1 1/2 F.13 Canada)
700 D	587 mm	Oddball size formerly used on some GT models.

650 A	590 mm	French version of 26 x 1 3/8; Italian high-performance bikes for smaller riders
650 B	584 mm	French utility bikes, tandems, and loaded-touring bikes; some older Raleigh and Schwinn mountain bikes
650 C	571 mm	Triathlon, time trial, high performance road bikes for smaller riders
600 A	540 mm	European Juvenile road bikes, most wheelchairs
550 A	490 mm	European Juvenile road bikes
500 A	440 mm	European Juvenile, folding
450 A	390 mm	European Juvenile
400 A	340 mm	European Juvenile



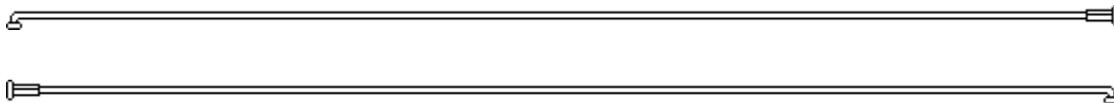
ISO Cross Reference:

ISO Bead Seat Diameter	Traditional Designations
787 mm	36 inch
686 mm	32 inch
635 mm	28 x 1 1/2, 700 B
630 mm	27 x anything except "27 five" and 609 mm
622 mm	700 C, 28 x (two fractions), 29 inch, 28 x 1 1/2 F.13 Canada
609 mm	Rare Dutch size, 27 x 1 1/2
599 mm	26 x 1.25, x 1.375 -- old US size
597 mm	26 x 1 1/4, 26 x 1 3/8 (S-6)
590 mm	26 x 1 3/8 (E.A.3), 650 A
587 mm	700 D -- oddball size made by GT
584 mm	650B, 26 x 1 1/2, "27 five"
571 mm	26 x 1, 26 x 1 3/4, 650 C
559 mm	26 x 1.00- x 2.125, also fatbike tires up to 5 inches wide
547 mm	24 x 1 1/4, 24 x 1 3/8 (S-5)
541 mm	600 A
540 mm	24 x 1 1/8, 24 x 1 3/8 (E.5),
520 mm	24 x 1, 24 x 1 1/8
507 mm	24 x 1.5- x 2.125
501 mm	British, 22 x 1 3/8, 22 x 1.00
490 mm	550 A

489 mm	Dutch juvenile 22 x 1 1/8 NL, 22 x 1 3/8 NL
484 mm	550 B
457 mm	22 x 1.75; x 2.125
451 mm	20 x 1 1/8; x 1 1/4; x 1 3/8
440 mm	500 A
438 mm	Dutch juvenile, 20 x 1 3/8 NL
428 mm	Swedish, 20 x 2
419 mm	20 x 1 3/4
406 mm	20 x 1.5- x 2.125
390 mm	450 A
369 mm	17 x 1 1/4
355 mm	18 x 1.5- x 2.125
349 mm	16 x 1 3/8
340 mm	400 A
337 mm	16 x 1 3/8
317 mm	16 x 1 3/4
305 mm	16 x 1.75- x 2.125
288 mm	350 A
254 mm	14 x 1.75
203 mm	12 1/2 X anything.
152 mm	10 x 2
137 mm	8 x 1 1/4

Most of this information was compiled by [John Allen](#) for *Sutherland's Handbook For Bicycle Mechanics*, the bible of bicycle technology. [Sutherland's, 6th edition](#) has a more detailed, more thorough version of this chart.

Got an unmarked rim but no tire? [Click Here for how to measure Rim Size.](#)



Width Considerations

Although you can use practically any tire/rim combination that shares the same bead seat diameter, it is unwise to use widely disparate sizes.

If you use a very narrow tire on a wide rim, you risk pinch flats and rim damage from road hazards.

If you use a very wide tire on a narrow rim, you risk sidewall or rim failure. This combination causes very sloppy handling at low speeds. Unfortunately, current mountain-bike fashion pushes the edge of this. In the interest of weight saving, most current mountain bikes have excessively narrow rims. Such narrow rims work very poorly with wide tires, unless the tires are overinflated...but that defeats the purpose of wide tires, and puts undue stress on the rim sidewalls.

[Georg Boeger](#) has kindly provided a chart showing recommended width combinations:

**Which tire fits safely on which rim?
[all dimensions in millimeters]**

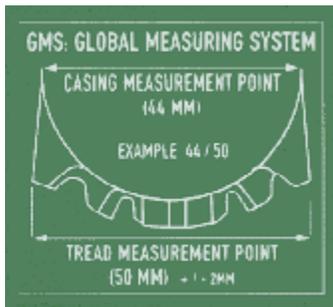
Rim width (interior)	Tire width													
	18	20	23	25	28	32	35	37	40	44	47	50	54	57
13	X	X	X	X										
15			X	X	X	X								
17				X	X	X	X	X						
19					X	X	X	X	X	X				
21							X	X	X	X	X	X		
23									X	X	X	X		
25										X	X	X	X	X

Note: This chart may err a bit on the side of caution. Many cyclists exceed the recommended widths with no problem.



[Wilderness Trail Bikes' Global Measuring System](#)

From the [WTB Website](#):

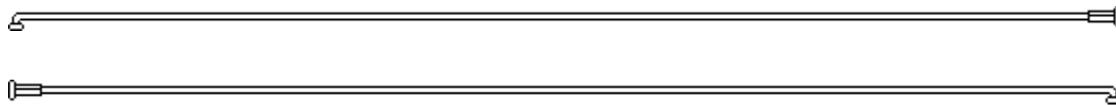


GMS Global Measuring System The current industry standard for specifying the actual inflated size of a bicycle tire does not account for subtle variation in tread

and casing size. To address this problem and provide you with more information for comparing tires, WTB has introduced the Global Measuring System (GMS) for tire measurement.

The GMS uses a two-number system: the first number is the width of the casing, and the second number is the width of the tread, both in millimeters. These measurements are taken on a rim which is 20 mm wide at the bead-capturing point, with a tire inflated to 60psi and maintained for 24 hours.

In addition to being able to accurately size a tire, knowing the actual casing size and tread width provides an indication of air volume, tread characteristics and tread contact area; all of which provide you with a more concise idea of what ride characteristics to expect from each of WTB's tires.



[Tubular Tires \("Sew-ups"\)](#)

Tubular tires are mainly used for racing. A tubular tire has no beads; instead, the two edges of the carcass are sewn together (hence the term "sew-up") with the inner tube inside. Tubulars fit only on special rims, where they are held on by cement.

Unless special cement which does not allow on-road replacement of a tire is used, tubulars "squirm" against the rims and are slower than the best wired-on tires, even though lighter -- see [details from Jobst Brandt](#).

Tubulars existed in several different sizes, but only 700c and 26-inch tubulars are readily available these days. **Beware: sizes of 26" and 24" tubulars are not well-standardized. Take the rim with you when buying a tire, and vice versa.** Size variations of tubulars are covered in *Sutherland's Handbook for Bicycle Mechanics*, 7th Edition, available from [Sutherland's](#), and on the mechanic's bookshelf at better bike shops.

- Full-sized tubulars fit rims of the same diameter as 622 mm (700c) clinchers. This size is sometimes referred to as "28 inch" or "700". It is also, confusingly, sometimes referred to as "27 inch." The "27 inch" designation is inaccurate and obsolete, but you'll sometimes run into it in older printed material.

In clincher tires, there is a real difference between "700c" and "27 inch" sizes, but for tubulars this is a false distinction. Whenever you see mention of "27 inch tubulars" the writer is actually referring to standard full-sized tubulars, as used on most racing bikes.

- "26 inch" or "650" tubulars are smaller, mainly used on time-trial or motorpacing track bikes. **There are two common "26 inch" sizes, corresponding to the 584 mm and 571 mm ISO sizes. There are a couple of oddball sizes as well.**

- "24 inch" (**two slightly different sizes**), "22 inch" "20 inch" and "18 inch" tubulars are sizes formerly used for children's racing bikes, but pretty much extinct these days. The "18 inch" size corresponds to the "17 inch" (369 mm) size used on Moulton bicycles.

Tubulars are also sometimes called "sew-ups" or "tubs" (British usage.)

If you want to sound like an ignorant yahoo, call them "tubies" or "tubeless tires."



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