

## Explanation of the application of the “Golden Ratio” to woodturning

You may be aware of the fact that some people (me included) espouse the so-called "Golden Ratio" for the ratios of some features of some woodturning forms. There are many articles online about the math involved, and most of them are more confusing than they are helpful. You can delve deeper as you wish -- this Wiki article is a lot more than you would ever want to know, but it does a thorough job: [https://en.wikipedia.org/wiki/Golden\\_ratio](https://en.wikipedia.org/wiki/Golden_ratio)

The purpose of this article is to simplify it for you. If you think of this ratio in terms of the sides of a rectangle, you can look at the ratio as long/short or short/long, as you wish. The Golden Ratio, per se, is applied as long/short. The numerical value is often expressed mathematically (and arbitrarily, but for convenience) with the Greek letter "phi". As such, the Golden Ratio is  $\phi = 1.618\dots$ , where the decimals go on forever. It's actually exactly equal to  $(1+\sqrt{5})/2$ . If you're interested, the derivation and geometric interpretation is in the above Wiki article.

As woodturners, we often tend to think about it as short/long or  $1/\phi$ . It can easily be shown mathematically that  $1/\phi \equiv \phi - 1$ . (That's an "identity" sign, if you're not familiar with it.) So, in application, the value we use is 0.618. Another value that comes up frequently in our application is the unity complement of that, or 0.382 – i.e., "the other part", if you think about it. Historically, artists and architects have found these values to be aesthetically pleasing to the human eye-brain combination and used them in many ways in their works.

You will find those two values applied to woodturned forms in many applications, such as:

- 1) the ratio of the height to the diameter (what it looks like from a side view);
- 2) the ratio of the diameter of the foot to the maximum diameter;
- 3) the ratio of the mouth of an open form to the maximum diameter;
- 4) the ratio of the height of the maximum diameter to the total height; and others.

You get the point.

Then somebody less math oriented thought 0.38 was kind of close to 0.33, and the so-called "Rule of Thirds" was born. You'll hear that a lot, but it's a weak approximation.

Clearly, there's no magic here. It's all a matter of personal, subjective artistic seeing. But there's a LOT of history behind the use of the Golden Ratio in artistic applications.

So, next time you're at the drawing board, or designing at the lathe, imagine the values of 0.62 and 0.38 to be worthy of your consideration for some dimensional ratios in your piece.

*Always use common sense. Things that work in one situation may not work in another. Follow all Safety Rules. If it feels wrong, it probably is; stop and rethink. Your Mileage May Vary*