

CALIBRATION OF DEPTH GAUGE

Every Rodmaker goes through a calibration crisis at one time or other in their career. Many rodmakers start off simply by zeroing the depth gauge by setting it on a flat surface, usually the final form, and using that value as a zero. Then they discover latter that the tip of the 60-degree point may have become flat and that effect the setting of the taper making the depth set slightly deeper than it reads resulting in oversized dimensions on the finished rod. Now they become aware of the need to accurately set zero on their depth gauge.

Calibration Blocks

There are several different calibration blocks / methods available for setting the depth gauge to zero. Each has their strengths and weaknesses. The common weakness is the 60-degree groove and 60-degree point itself. What this article does is to give you a simple method to accurately check the depth of the form to double check the calibration reference standard you are currently using to insure they are correct and accurate.

Using Rods to Measure Depth

I had first read about using drill rods for setting planing forms in Ted Knott's article "Methods for Setting the Planing Form" in The Planing Form (Issue #26 – Mar./Apr. 94). I've seen John Zimny's shop and the depth gauge base that John Bokstrom made for him to set his forms. The use of rods to set forms is almost mandatory for setting Quad forms. This insures both the left and right hand form is set exactly. Any difference in the depth results in glue lines. John Long provides a calibration rod and uses the method to set his "V" blocks that attach to the dial caliper for accurately measuring strips without crushing the apex. Since I did not have a depth gauge base suitable for using this method I continued to use the more traditional 60-degree point on a depth gauge method. I had calibration references that I have used for a long time that I had confidence in and the results reinforced my confidence.

Need to Double Check your Standard

Then came a day when I used someone else's calibration method using a 60-degree point. The results I got differed significantly (in rodmakers terms) from what I expected. In addition there was also a posting on the Rodmakers Listserve concerning a rodmaker who did not get the expected results which turned out to be significantly oversized from what

they believe the taper should be. So to resolve the problem and to restore my confidence I reached back to the method of using rods to set forms and to use it as a double check of my current standards. I also realized that it provides an independent method to check the depth of a setting while bypassing the issue of setting / zeroing the 60-degree points. The only variable left is the form itself. Even then, you can use two different drill rods at the same station to confirm the form's groove is a true 60-degree angle.

Method

Here is the method that all rodmakers can follow to double check their depth gauge setting using just your Dial Caliper, a drill rod (or any round metal rod), and their final form:

- **Measure the thickness of the form at the station you have set with your Dial Caliper.**



FIGURE 1. Measure Form Thickness.

- **Inset a drill rod / drill bit into the form (usually 1/8, 10/64, or 7/32 drill bit will work) and measure the thickness again to the top of the drill bit.**

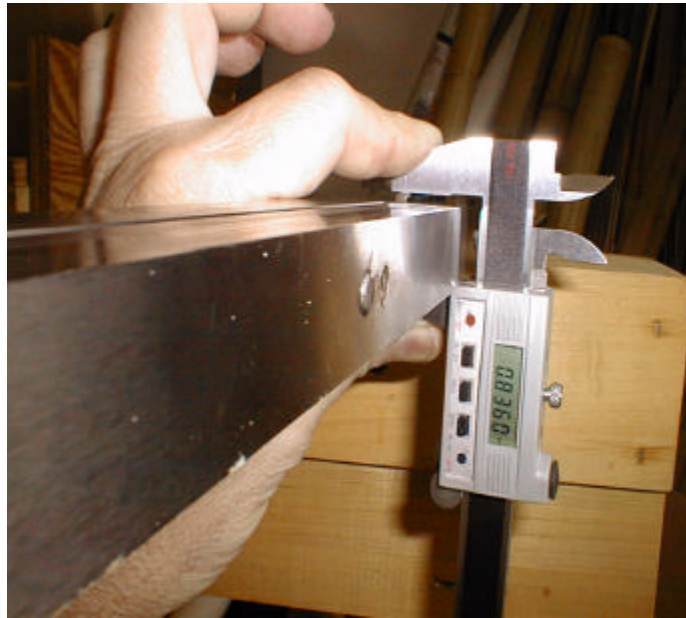


FIGURE 2. Measure with drill rod in groove.

- Measure the diameter of the drill rod / bit.

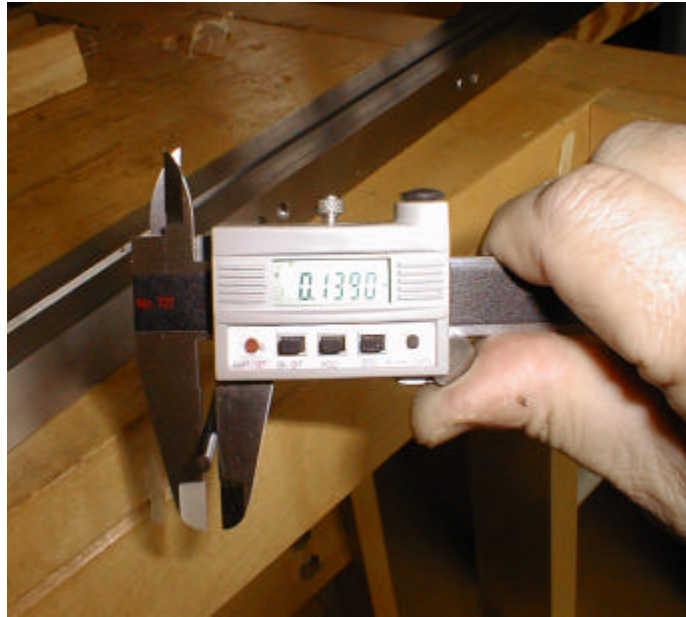


FIGURE 3. Measure the diameter of the rod.

Doing the Math

Now do the following math:

Depth = (1.5 times Drill Rod Diameter) minus (Thickness with rod minus Form thickness)

For the example illustrated above:

$$\text{Depth} = (1.5 \times .139) - (.836 - .747)$$

This reduces to Depth = (.2085 - .089) or

$$\text{Depth} = .1195$$

Check against depth gauge

Now you can check the reading on your depth gauge and see how it compares.



FIGURE 4. Check your depth gauge.

If you have an accurate calibration then the readings should be the same.

Discrepancies

If you have a discrepancy and do not believe the discrepancy then you can do the following:

- First substitute a different size rod at the same station and double check the form. Two different drill rods should yield the same result.
- You can then move on to other stations that you have set and see if you get a consistent discrepancy between the drill rods and your depth gauge. If you get a consistent discrepancy, then I would have to say your previous calibration was off by that amount.

Form Accuracy

The final form can be identified as the source of your problems and not your calibration block / methods if you have accurately measured at the same station(s) with two or three different size drill rods and consistently got variances in the calculated depth. This means the angle of the groove is not exactly 60 degrees. This problem with the form will affect any method of depth measuring and most certainly impact the quality of your rods. A good final form is the basis for all rodmaking. So make sure yours is good.

Summary

This method helped me resolve issues of calibration because it provided a separate and different method to accurately check the depth of a form at a station. It also verified the accuracy of the 60-degree groove in my final form. I would like to get a dial indicator base with flat tip to use this method exclusively and avoid the need to calibrate with a 60-degree tip. But for the present it has gotten me back on track and not to have to worry if the zero on my depth gauge is correct or not. Every rodmaker can benefit from using this method to verify the accuracy of their depth gauge setting.