TECH TIPS

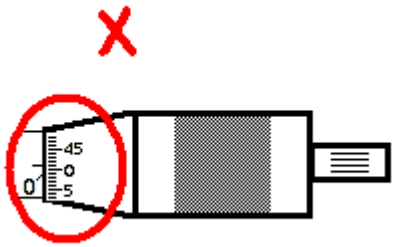
Precision Measuring Tools

Micrometers:

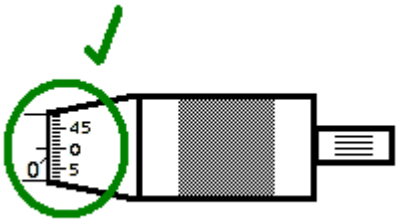
Warning:

Never store a micrometer with the measuring tips closed. Thermal expansion and contraction will damage the micrometer.

One of the things I noticed while working with someone I observed that the micrometer they were using has never set to *zero*. See the sketch on the right. I was mortified, how can you determine if the parts are good or bad without having your micrometer set to zero? I was told that they just "eyeballed" the reading… why bother using a micrometer then?

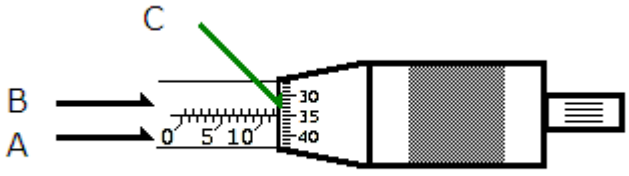


I asked for the case from the micrometer and the little tool with a C on each end was there (see picture on left). I took the tool and set the micrometer to zero and was told "Wow, I never knew what that thing was for". There is a small hole on the sleeve that the tool fits into to adjust the zero by turning the sleeve till it lines up with the spindle.



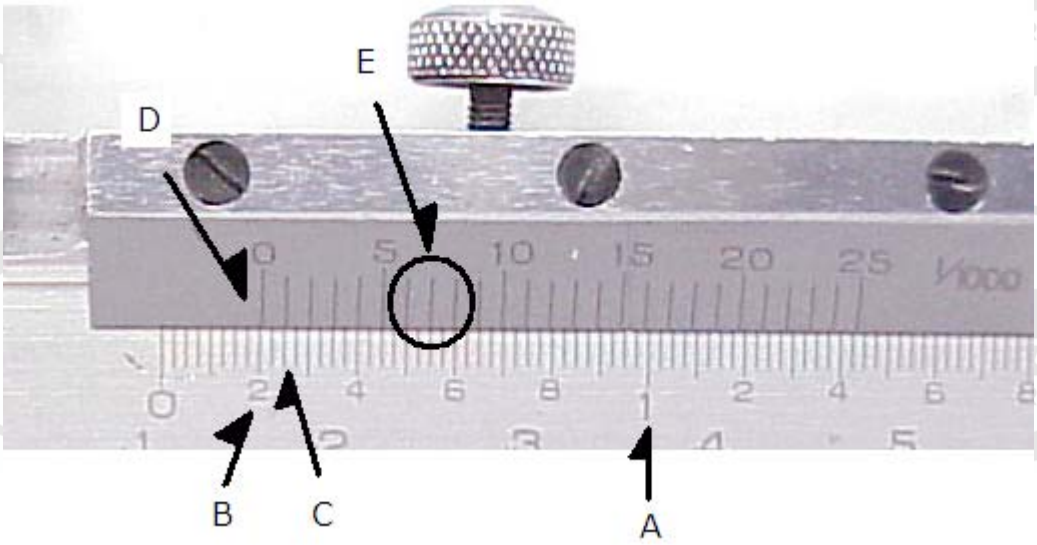
To take the readings the ratchet mechanism must be used (some are on the end as shown in the sketch and others are a spring built into the handle). They are designed to control the torque and give consistent readings.

To get the reading simply take the number from the sleeve of the lines that have been passed and add the number from the spindle that lines up with the line that the numbers are on. For example the reading on the right would be 11 (from the "A" scale) plus 0.50 (from the "B" scale) plus 0.35 (from the "C" scale on the spindle) making 11.85.



Vernier Scales on Callipers or Micrometers:

For those who have the Vernier scale type calliper or micrometer, which are more durable (as there are no gears to keep clean and no batteries to replace) and offer highly accuracy.



The first digits are read from the fixed scale on the rule where the “zero” from the slide passes them. In the example above (in inches) the slide has not reached the “large 1” (A) but has passed the “small 2” (B) this would be 0.2 plus a little. The “zero” from the slide has not passed the 0.025 increment lines (C) so the last digit would be read from the slide. Look for 3 lines on the slide that look like they line up with the lines on the fixed scale, the one in the middle is the one to use for the reading, in this case 0.007. Then add up all of the numbers giving 0.207 inches.

> **NOTE:** When using metric the divisions will typically be in factors of 10 (1/10, 1/100) and in inches the scale is typically in 1/10 for the one scale and then in 25/1000 for the finer scales.