



Basic Trades Measuring Tools Training Part 1

IN THIS TRAINING YOU WILL LEARN:

1

Several types of basic measuring tools used in many trades.

2

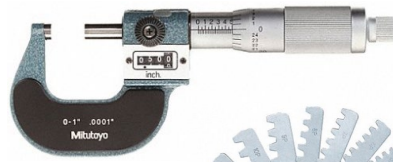
How to read these measuring tools.

In this lesson you will learn the following tools:

1. Dial and Digital Caliper



2. Outside Micrometer



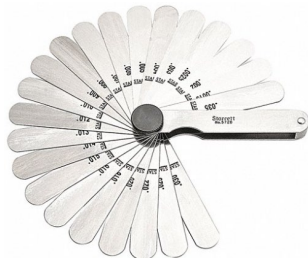
3. Thread Pitch Gage



4. Radius Gage



5. Feeler Gage



How to use and read a DIAL CALIPER

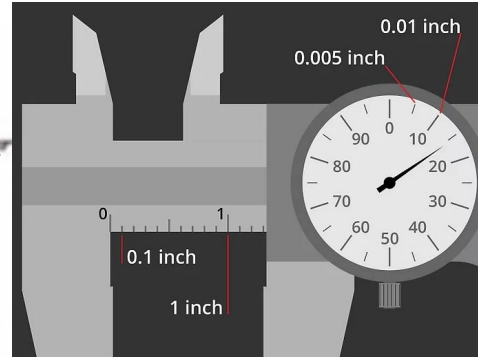
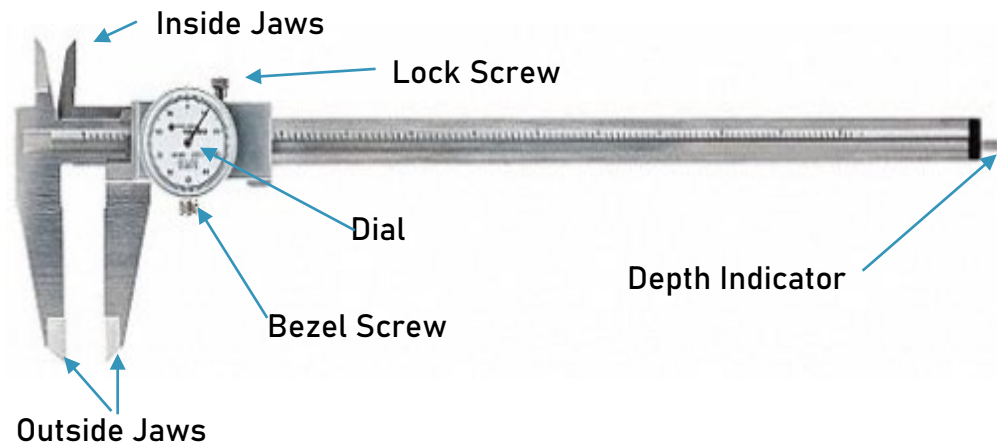


Fig 1

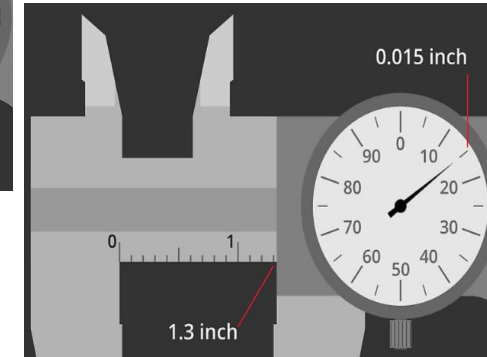


Fig 2

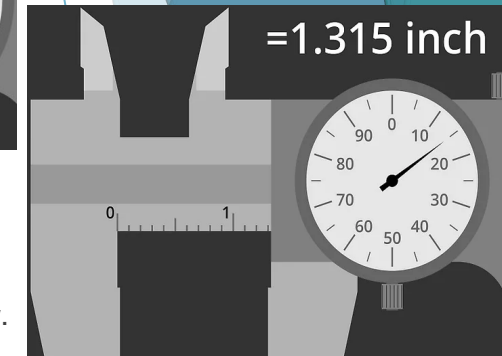
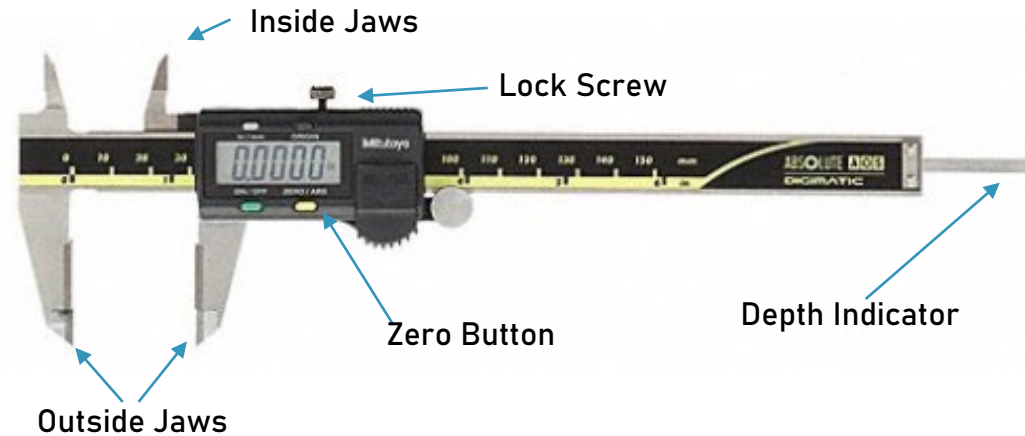


Fig 3

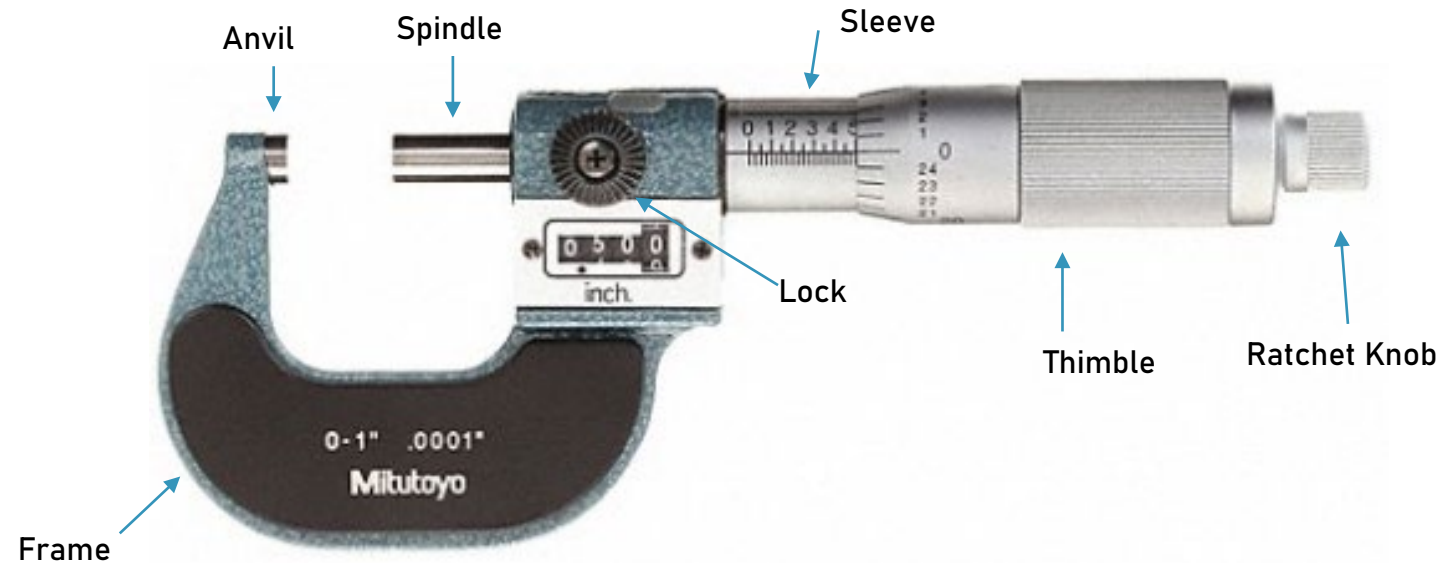
1. Wipe off the inside surfaces of the jaws and close them to ensure there are no burrs or debris.
2. With the jaws still closed, loosen the bezel screw and twist the outside of the dial until the needle is set to zero and tighten the bezel screw.
3. Use Inside jaws for internal measurements, outside jaws for external measurements and depth indicator for measuring depth.
4. Open the jaws and measure the part. Ensure the jaws are snug on to the part. Tighten the lock screw just enough so the jaws do not move when removing the caliper from the part.
5. Before determining the measurement, know what the marks mean: Every mark equals $\frac{1}{10}$ or .1 and every 10 marks equal 1 inch (2.5 cm) and on the dial indicator, the number that the needle rest on needs to be expressed in thousandths so whatever number you receive should be multiplied by .001. (Fig 1)
6. When looking at the caliper there is a straight edge to the left of the dial indicator. First find how many inches the straight edge went past and then see how many tenths the straight edge went past and write this down. Now look at the dial indicator take the number under the needle and multiply it by .001 and write it down. (Fig 2)
7. Add all the numbers making sure the decimal places are correct. (Fig 3)

How to use and read a DIGITAL CALIPER



1. Wipe off the inside surfaces of the jaws and close them to ensure there are no burrs or debris.
2. With the jaws still closed, press the ZERO button on the display to zero out the reading.
3. Use Inside jaws for internal measurements, outside jaws for external measurements and depth indicator for measuring depth.
4. Open the jaws and measure the part. Ensure the jaws are snug on to the part. Tighten the lock screw just enough so the jaws do not move when removing the caliper from the part.
5. The number on the display screen is the measurement of the surface.

How to use and read a MICROMETER



1. Clean the Anvil and Spindle to ensure there are no burrs or debris.
2. You may hold the Micrometer in your hand, or lightly secure the Micrometer in a clamp to free up both hands for measuring.
3. Place the Micrometer over the object to be measured and spin the ratchet knob until it clicks. This ensures that you do not over tighten the thimble. Set the thimble lock while the Micrometer is on the object.
4. Remove the object (or remove the Micrometer from the object).

How to use and read a MICROMETER Cont'd

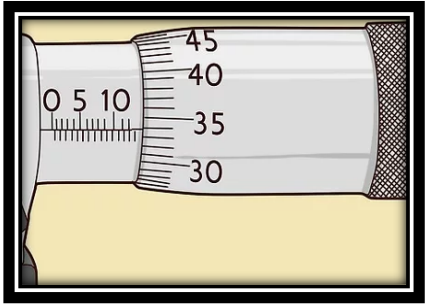


Fig 1

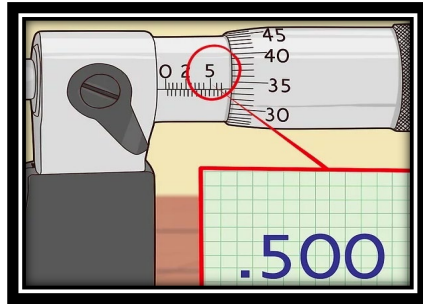


Fig 2

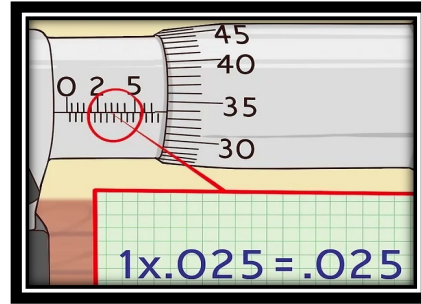


Fig 3

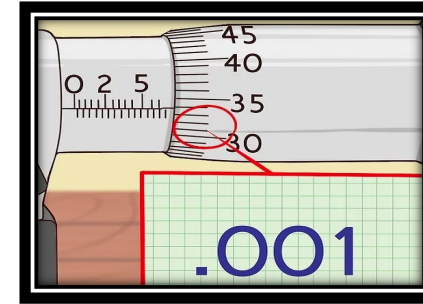


Fig 4

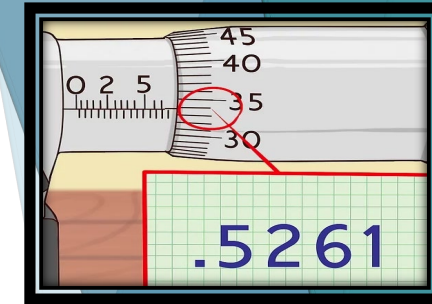


Fig 5

1. Learn the different number scales on the thimbles. (FIG 1)

On the sleeve is a scale that measures by the one-hundred thousandths or $1/10$ of an inch; in decimal form it would be .100.

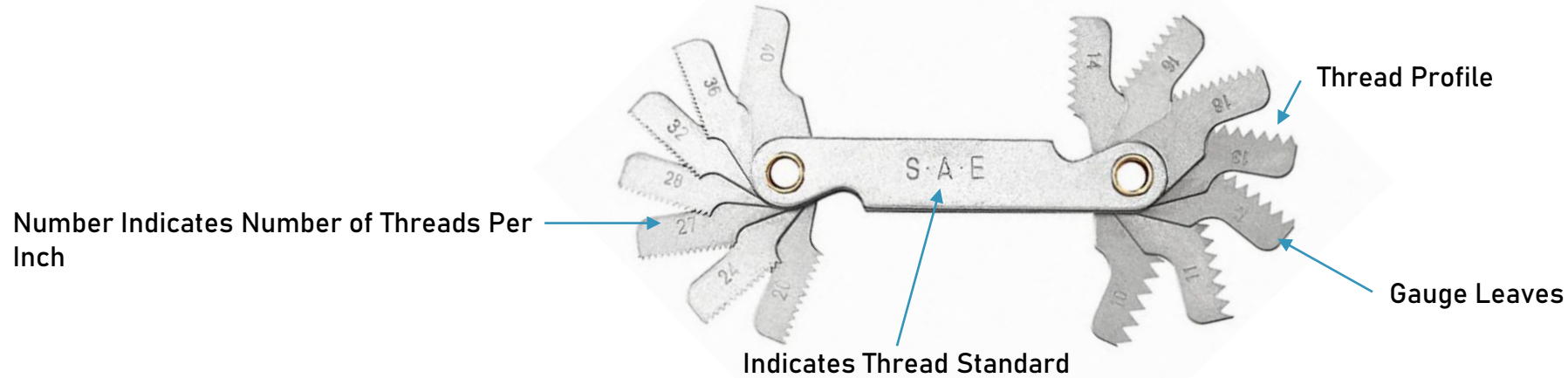
In between those whole numbers are three lines that represent twenty-five thousandths of an inch; in decimal form, it would look like .025.

The thimble has evenly spaced lines that represent one-thousandth of an inch; in decimal form it would be .001.

Above the whole number scale on the sleeve are lines that measure to ten-thousandths of an inch; in decimal form it looks like .0001. You may hold the Micrometer in your hand, or lightly secure the Micrometer in a clamp to free up both hands for measuring.

2. Read the whole number on the sleeve first. The last visible number will read as the thousandths. For example, if the last number you can see on the sleeve is 5, then it would read 500 thousandths, or .00005. (FIG 2)
3. Read how many lines come after the whole number. Look at the individual markings exposed next to the 100 thousandths and multiply each marking by .25.. In this case $1 \times .025$ would be .025. (FIG 3)
4. Find the number and corresponding marking on the thimble scale closest to but underneath the measurement line on the stock. If it's closest to 1, then it would be .001. (FIG 4)
5. Add those three numbers together. In this case it would be $.500 + .025 + .001 = .526$.
6. Flip the micrometer over to read to the 10 thousandths marking. Read that line that lines closest with the sleeve. If, for example, it lines with 1, then the measurement will read .5261 (FIG 5)

How to use a THREAD PITCH GAUGE SET



1. Open the gauge set and select the leaf that most closely resembles the threads to be measured.
2. Place the leaf inside the thread. All of the thread peaks on the leaf should fit into the thread valleys on the threads being measured.
3. Continue to try different gauge leaves until you find a leaf that fits snugly into all of the threads. The number indicated on that leaf is the threads per inch.

How to use a RADIUS GAUGE SET

Internal Radius Gauge Leaves

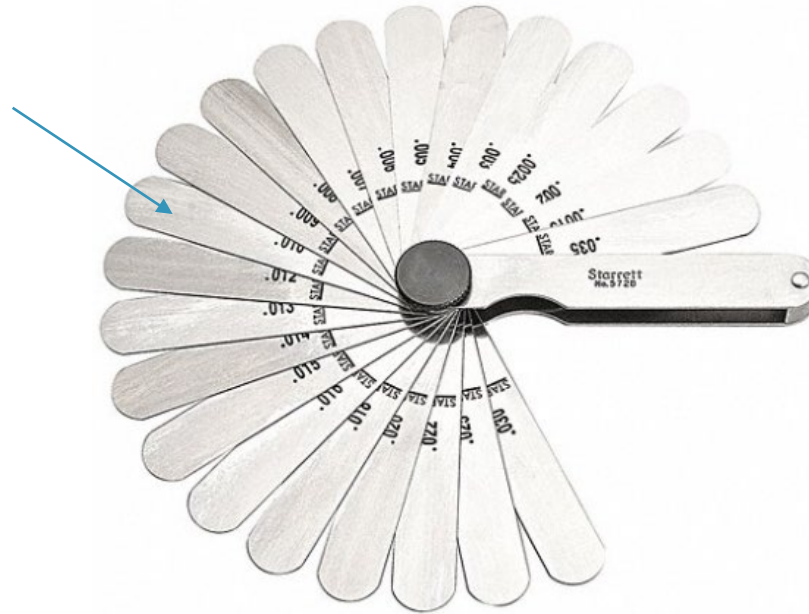


External Radius Gauge Leaves

1. Open the gauge set and select the leaf that most closely resembles the radius to be measured.
2. Place the leaf on the interior or exterior (depending on the type of radius being measured) of the radius and look closely to see if light is shining through between the gauge and the component being measured.
3. If light is seen, continue to try different leaves until a perfect, or near perfect fit is achieved. The number on the leaf indicates the measurement of the radius.

How to use a FEELER GAUGE SET

Feeler Gauge Leaves



1. Open the gauge set and select the leaf that most closely resembles the gap to be measured.
2. Place the leaf inside the gap feeling for any resistance.
3. If there is no resistance, select leaves increasing in thickness until the leaf will pass into the gap with little resistance. This is your measurement.
4. If there is resistance, or the leaf will not pass into the gap at all select a leaf that is thinner until it will pass into the gap being measured with little resistance. This is your measurement.
5. The number on the leaf indicates the thickness of the gap.