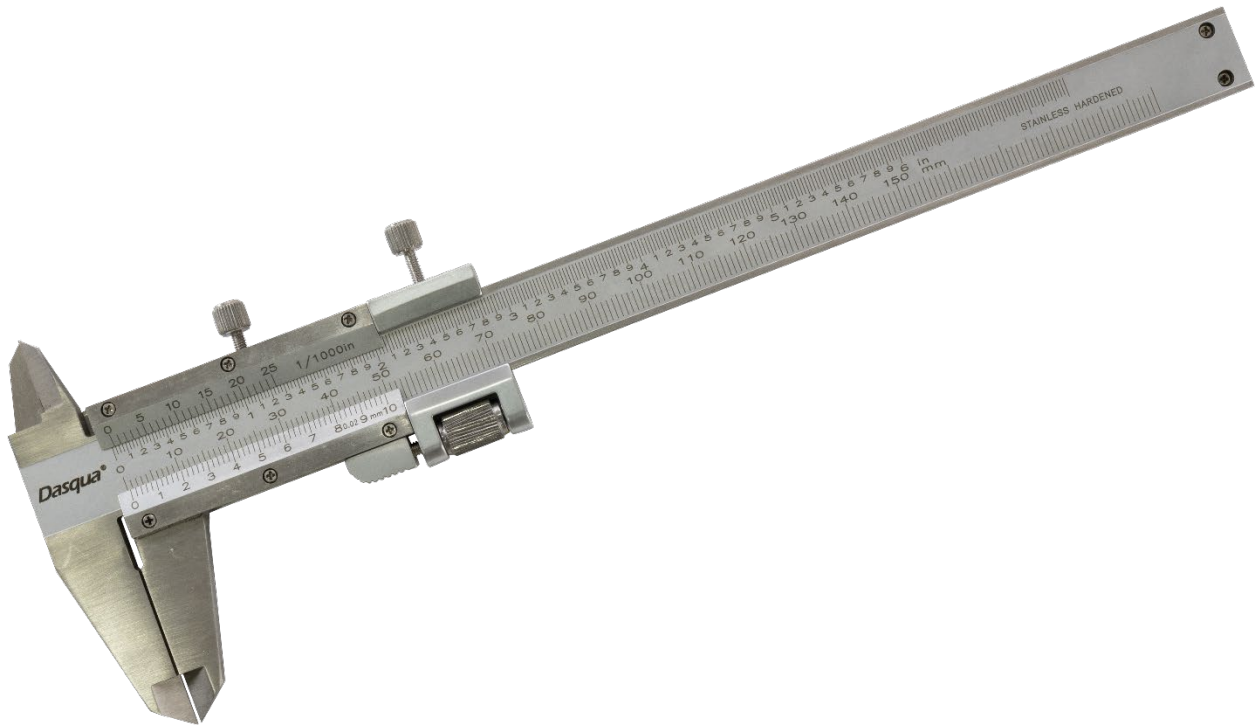




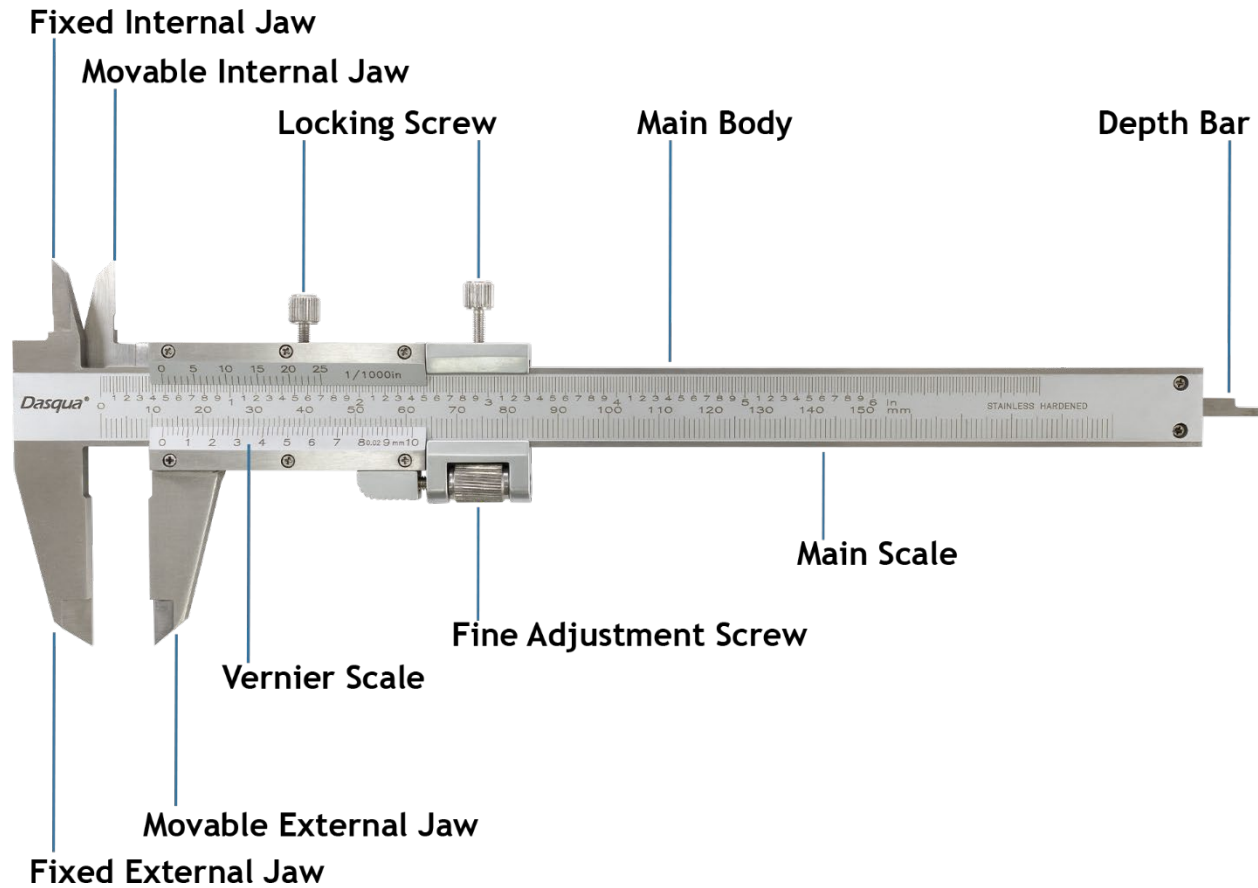
Reading a Vernier Caliper



A Vernier caliper consists of two scales, the main scale and the vernier scale. The main scale is fixed while the vernier scale slides as the calipers are adjusted to the item/area being measured.

Both scales typically have inch and metric divisions. The Vernier scale will provide increments that are smaller than the main scale. These divisions are a fraction of the main scales divisions.

Parts of a Vernier Caliper



- | | |
|----------------|---------------------------|
| 1. Fixed Jaw: | 4. Vernier Scale: |
| 2. Moving Jaw: | 5. Locking Screw: |
| 3. Main Scale: | 6. Fine Adjustment Screw: |

Reading the Caliper

Before measuring, make sure your caliper is clean and lubricated to ensure smooth movement of the slider. Also check that the clamping screw is not exerting any force on the main scale. Once a measurement is taken, the locking screw may be used to secure the caliper at the desired measurement so that it can be moved away from the work piece for reading.

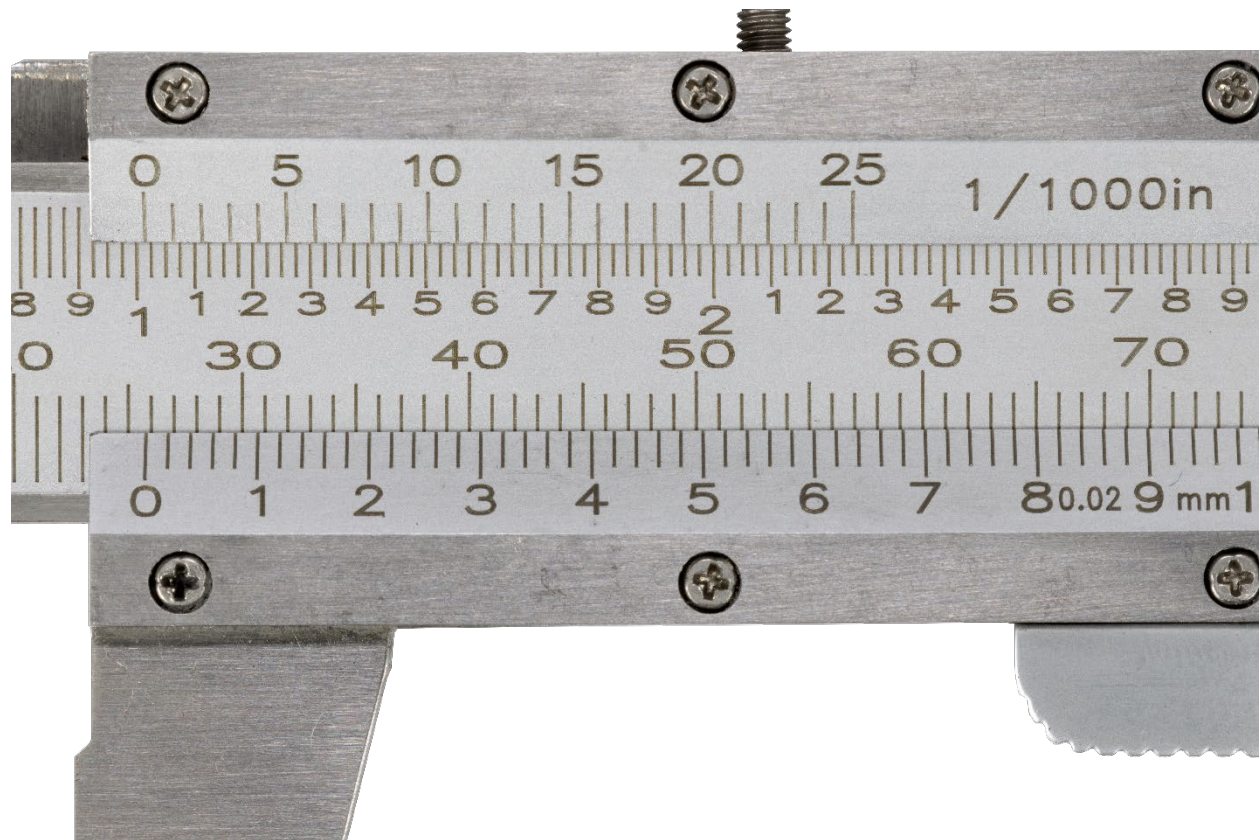
Reading the scales

The final reading will be comprised of the sum of the main scale (X) and the Vernier scale (Y).

1. Fit the caliper faces to the item being measured.
2. Note the reading on the main scale.
3. On the Vernier scale, one graduation line will align more precisely to the main scale than the other graduations. This will be your second measurement.
4. Your final reading will be the sum of the main scale measurement and the Vernier measurement.

Practical example

The image below shows a measurement taken with a Vernier caliper that has inches graduations of 0.001" (1/1000th) and millimeters of 0.02mm. Reading these measurements gives the following:



Inches

The Zero reference on the Vernier scale falls after 1" but before the next mark which would be 1.025" so the value of the main scale (X) is 1".

Reading the Vernier scale shows that the best aligned marks are at 15 which in thousandths is 0.015". This is our (Y) value. The two measurements together, 1" + 0.015" equals 1.015".

Metric

The Zero reference on the Vernier scale falls after 25mm but before 26mm so the value of (X) is 25mm. On the Vernier scale the graduation mark that best aligns is a little more than 7.8 and a little less than 8.0 (0.78mm - 0.80mm). (Note: each graduation is 0.02mm so the marks between 7 and 8 are 0.02mm, 0.04mm, 0.06mm, and 0.08mm.) So, the value of (Y) in mm is 0.78+.

With (X) of 25mm and (Y) of 0.78+ we can derive a final value of 25.78mm. (As an aside, multiplying our inches results by 25.4 yields our metric results $1.015 \times 25.4 = 25.781$)