

Metrology Facts (Summary of Contact Metrology Basics Notes)

1. In the accurate words of Israelle Widjaja, “properly measuring things is hard ☺.”
2. Rule of Ten: the gage or measuring instrument should be 10 times as accurate as the characteristic (i.e. smallest tolerance) to be measured.
3. A measuring instrument is useless if not calibrated regularly against a calibrated gage.
4. A measuring instrument which offers no constant torque method of measurement is junk; also, those that do only work if the clutch is rotated at consistent and constant velocity.
5. Whenever possible conduct measurements as close to NTP (normal temp and pressure) as possible (68°F & 1atm (14.696 psia)).
6. Whenever possible measure in an environment that will not damage the part or measuring instrument if either is dropped.
7. Clean the contact jaws or tips with alcohol and a piece of tissue paper before use.
8. Always remember to double check the zero of the measurement instrument before use.
9. Understand metals have a typical coefficient of linear expansion of 0.000010 in / (in-°F); therefore holding on to a measuring instrument and/or a part long enough will cause a 2" nominal part to change length 0.0006" due to temperature change alone.
10. Always take at least three measurements to be “carelessly certain” of the ballpark value.
11. Become proficient with gage blocks and gage pins, as these are typically manufactured to ± 0.000100 " or ± 0.000050 ", and are good for moderate precision calibrations.
12. Research Abbé and parallax error to understand why calipers are not regarded very highly in metrology circles ☺.