

## Measurement Error

Don walks into the QA room and walks over to you and says,

***“How come you rejected my part, I checked that thing right before I brought it in and it was right?”***

Now I am in the position of having to defend my method and results. First off, I want to become defensive, but if I put myself in his shoes and I believe I produced a quality part, then it is only logical that I should question the inspector, after all, he or she is capable of making a mistake. Maybe it's just a method problem.

O.K., its time to do some analyzing. First lets see what kind of gage produced the questionable results. Did the inspector utilize the 10:1 rule? Was the stated accuracy of the gage 1/10 of the allowable tolerance? Yes! I did the check on the CMM (Coordinate Measuring Machine) which has an accuracy statement of 0.0001” and repeatable within 0.0003”. Was the part clamped to the table without distorting the part or allowing the part to move during the probings? No, that seems to be O.K. Well, lets check it again to see if we can repeat the results. O.K. that done and the measurements are slightly different, but a very small difference.

***“Well, that makes sense since you first brought it to me hot off the machine, and now it has had time to cool down, so I would expect a little bit of difference.”***

***“Let's see if we can duplicate the results on the surface plate using a V Block and clamp and a 0.0001” reading indicator.”***

***“Well, there it is big as life, the same result within 2/10 of the reading on the CMM, do you agree that it's wrong?”***

***“Yeah, I just don't understand what happened, I'm gonna pull out that drill and check it on the scope, maybe there's a chip or something.”***

Here is the key element, if your measurement results come into question, follow these steps to eliminate measuring error questions:

- 1) Don't become defensive, either you or your method may be in error.
- 2) Redo the measurement to see if the results can be repeated.
- 3) Invite the machinist, customer, or vendor to stay and watch.
- 4) Use another method to see if the results can be duplicated.
- 5) If not, call in the QA Mgr. Or QA Engineer to help discover the “truth”.
- 6) Lastly, use team problem solving techniques to solve the problem.

Isolate the reason for variation and eliminate the variables. Arguing about who is right or wrong is counter productive, remove the ego's and let's produce quality parts. Remember, nobody produces bad parts on purpose, and we all want to do a good job. So, let's approach the truth through achieving correlation of results.