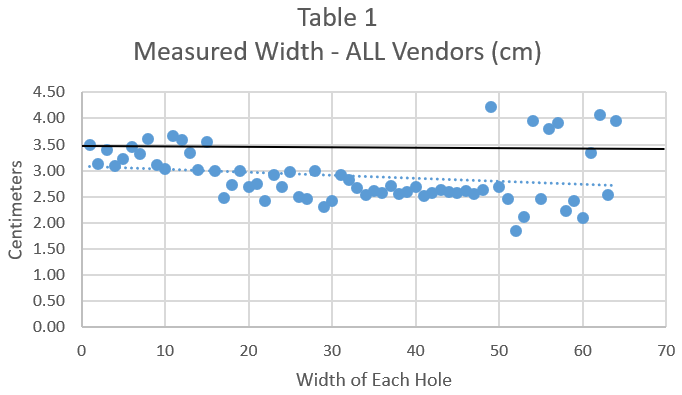
Cut-Rate Machining, Inc.

Cut-Rate Machining, Inc. is attempting to decide on a vendor from whom to purchase a drilling machine. Each of four vendors was invited to ship one machine to the plant facility for a test. All machines were warmed up for two hours between 8:00am and 10:00am. One employee from first shift tested the first three machines in 2-hour time periods (10:00 – noon, Noon – 2:00, 2:00 – 4:00). An employee from second shift completed. Sixteen (16) holes were drilled from each machine.

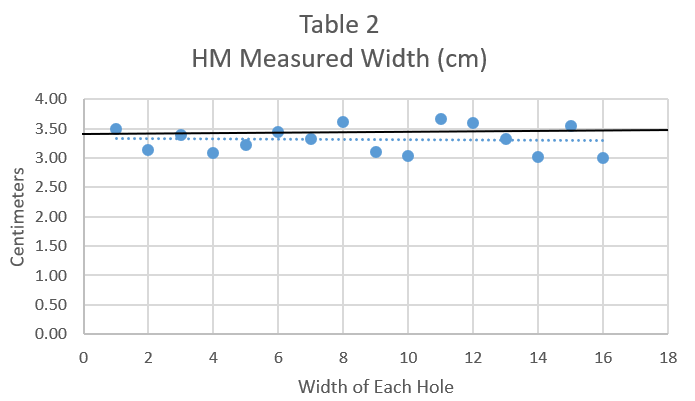
# Measured Width – All Vendors

Table 1 presents a scatter plot of the measured widths for all vendors. As indicated, the only 3cm widths were machined by the first two vendors. The trend line indicates a negative relationship between the number of holes drilled and the centimeter measurement.



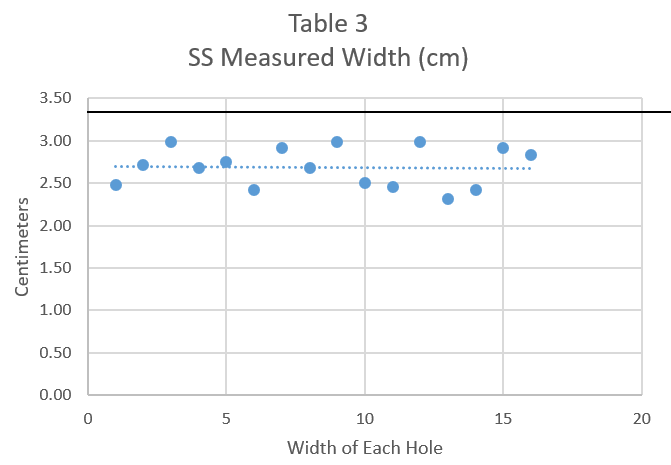
# Measured width - Hole-Maker, Inc. (HM)

Table 2 presents a scatter plot of the measured widths for Hole-Maker, Inc. (HM). As indicated, only 3 of 16 holes are cut to specification. The trend line indicates that the majority of the holes are greater than 3 centimeters in diameter.



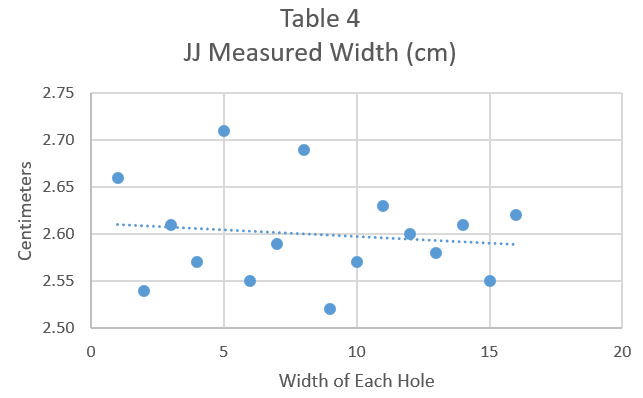
# Measured width – Shafts & Slips, Inc. (SS)

Table 3 presents a scatter plot of the measured widths for Shafts & Slips, Inc. (SS). Again, only 3 of 16 holes are cut to specification. The trend line indicates that the majority of the holes are smaller than 3 centimeters in diameter.



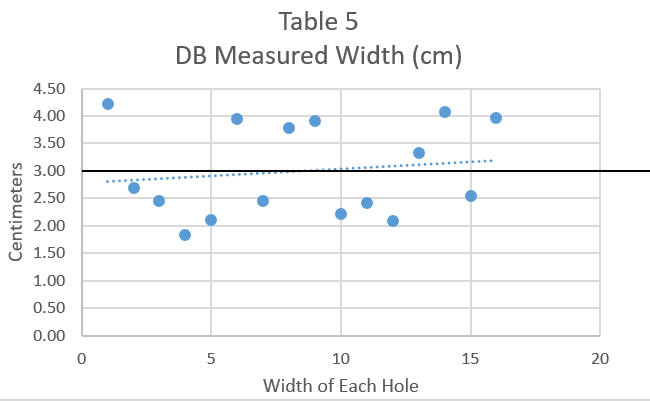
# Measured width – Judge’s Jigs (JJ)

Table 4 presents a scatter plot of the measured widths for Judge’s Jigs (JJ). None of the holes are cut to the 3-centimeter diameter designation. The trend line indicates a negative relationship between the hold width and centimeter diameter. There is no consistency in machining by this vendor.



# Measured width – Drill-for-Bits, Inc. (DB)

Table 5 presents a scatter plot of the measured widths for Drill-for-Bits, Inc. (DB). None of the holes are cut to the 3-centimeter diameter designation. The trend line indicates a positive relationship between the hold width and centimeter diameter. There is no consistency in machining by this vendor. Variability in centimeter width varies from less than 2 to greater than 4 centimeters.



# Sources of Error for Vendor Assessment

All 4 machines were warmed up at 8:00am for 2 hours. Machines were tested in the order of HM, JJ, SS, and DB. Only the HM machine was used immediately after warm up. The remaining machines were cooled down by 2, 4, and 6 hours before use. Each machine should have been warmed up for 2 hours immediately prior to use.

A first shift employee (Ms. Arnes) handled machining for the HM, JJ, and SS machines over 2-hour time periods. The variation in machining be a result of the number of hours worked. The only 3-centimeter diameters were cut between 10:00 and noon and noon to 2:00pm. Only 6 of the holes were cut to specification. By the end of her shift, Ms. Arnes machining diameters varied considerably. The closest was 2.71 diameters. The effect of machining over this 6-hour period by the same employee with declining centimeter accuracy should be considered.

A second shift employee (Ms. Silver) handled machining for the DB machine from 4:00 to 6:00pm. This machine had not been warmed up since 10:00am that morning.

This report presents results based on machining of 3-centimeter diameter holes in 25-centimeter-thick stainless-steel sheets by four invited vendors. None of the 4 vendors machines produced acceptable results. Going forward the test process should consider consistency in warming up each machine 2 hours prior to use as well as consistency in employees chosen to complete the process. One suggestion would be to test the machines over 4 days between 10:00am and noon after each machine has been warmed up between 8:00 and 10:00am.