

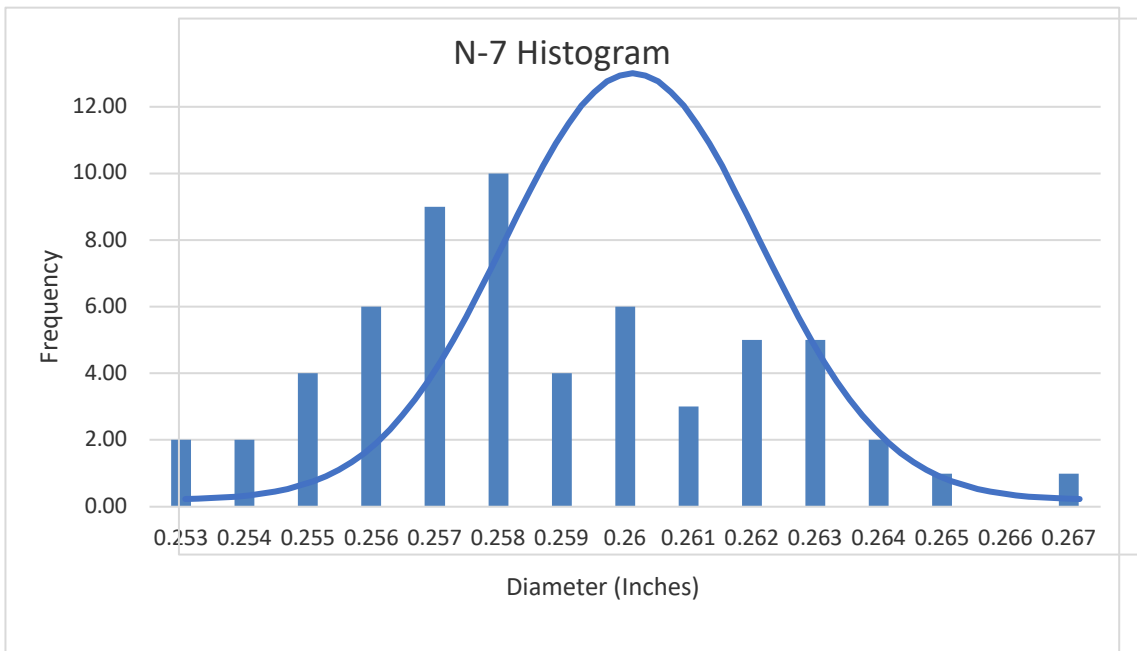
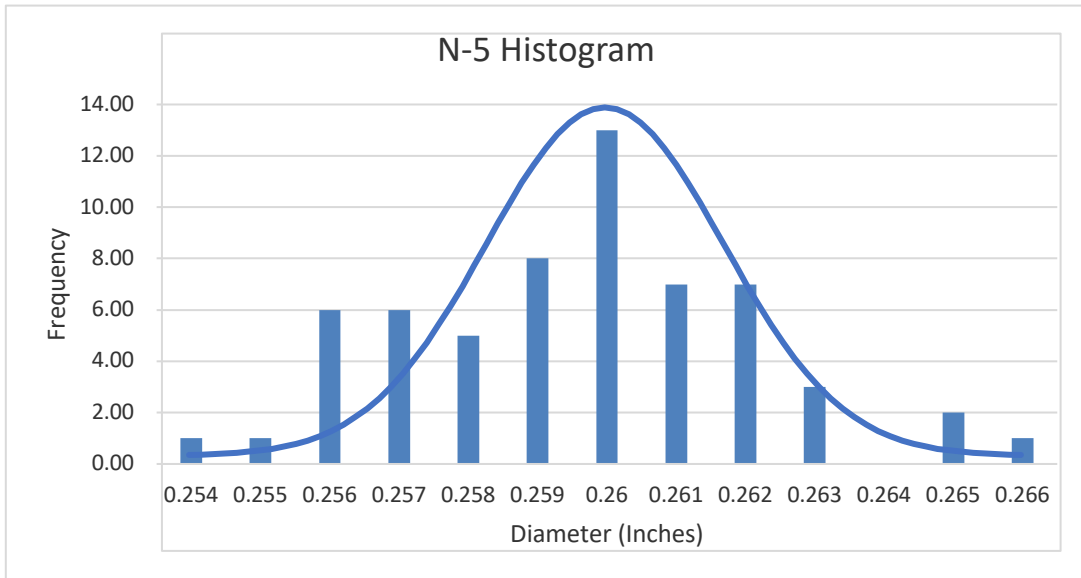
## Quality Engineering Report I: N5\_N7 Lab

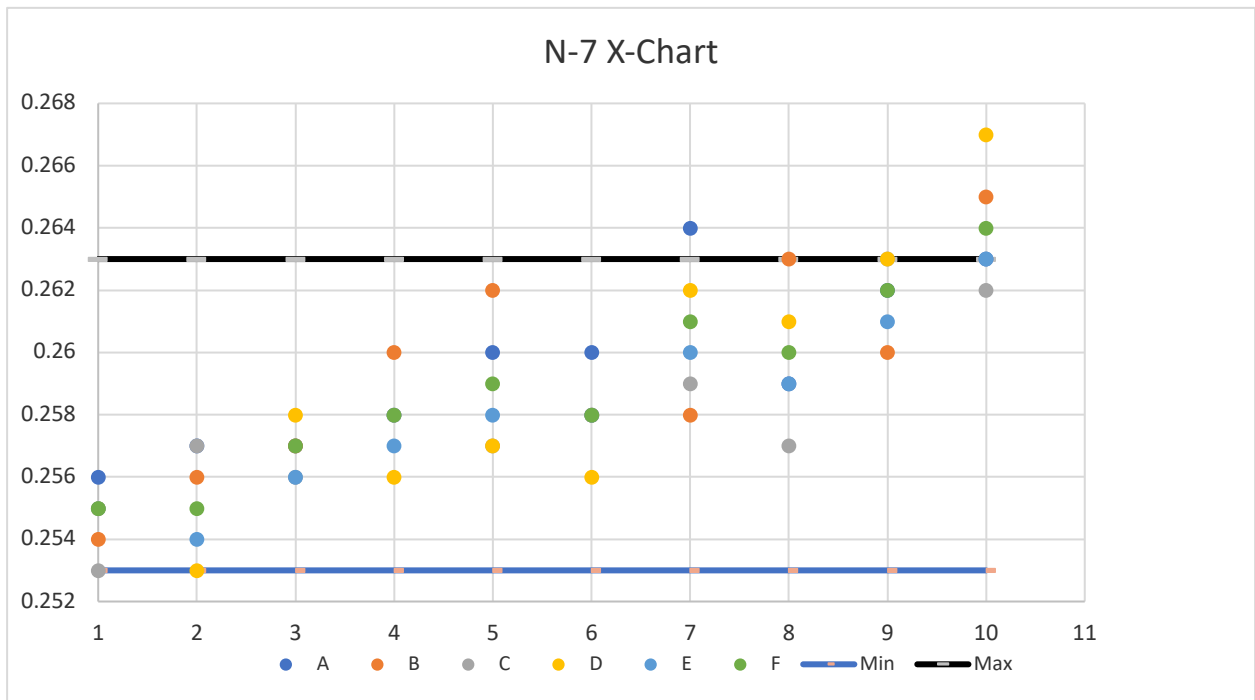
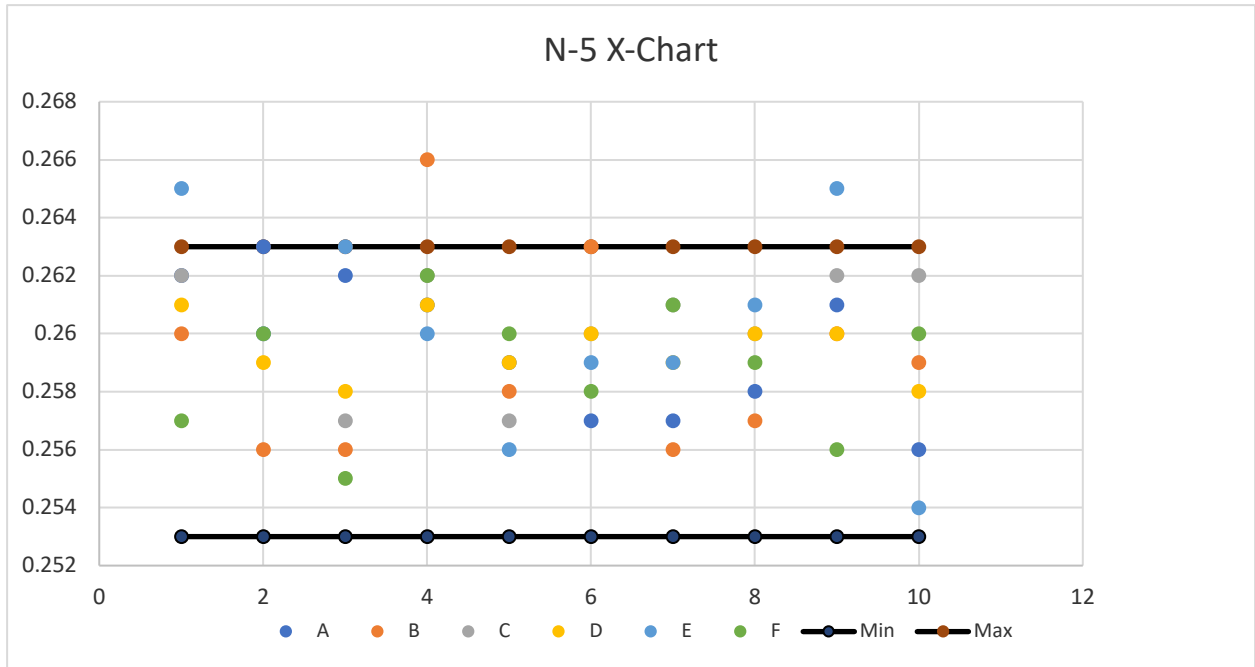
These are the provided data sets for the shafts turned on lathes N-5 and N-7. The readings are taken directly from the thimble of a 0"-1" micrometer. The process specification is 0.258 +/- 0.005.

			N-5				Subgroup
a	b	c	d	e	f		
12	10	12	11	15	7	1	
13	6	10	9	10	10	2	
12	6	7	8	13	5	3	
11	16	12	11	10	12	4	
9	8	7	9	6	10	5	
7	13	10	10	9	8	6	
7	6	11	9	9	11	7	
8	7	10	10	11	9	8	
11	10	12	10	15	6	9	
6	9	12	8	4	10	10	

			N-7				
a	b	c	d	e	f		
6	4	3	5	5	5	1	
7	6	7	3	4	5	2	
7	7	6	8	6	7	3	
8	10	8	6	7	8	4	
10	12	7	7	8	9	5	
10	8	8	6	8	8	6	
14	8	9	12	10	11	7	
9	13	7	11	9	10	8	
12	10	13	13	11	12	9	
13	15	12	17	13	14	10	

**Qualitative Analysis:**





Above are the histograms and the X charts for each of the processes. Without using any statistics, Process N-5 appears to be more capable, because the data falls more in line with the bell curve, which means that it is more precise than the N-7 process which is a lot more scattered.

**Quantitative Analysis:**

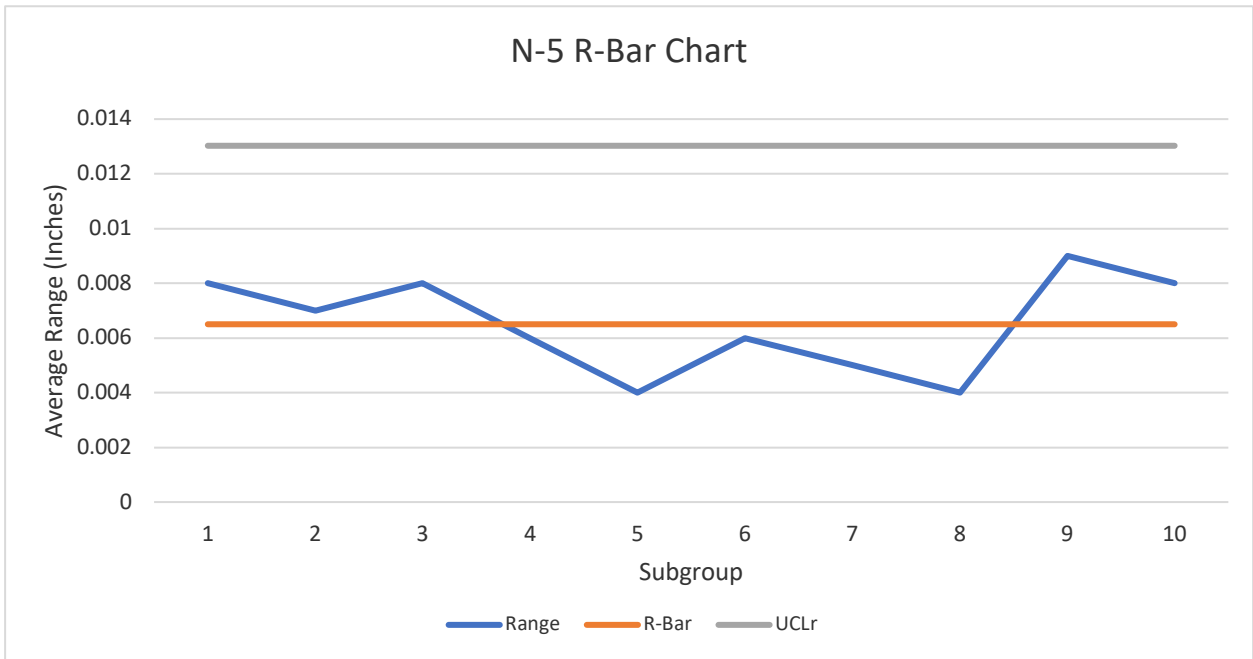
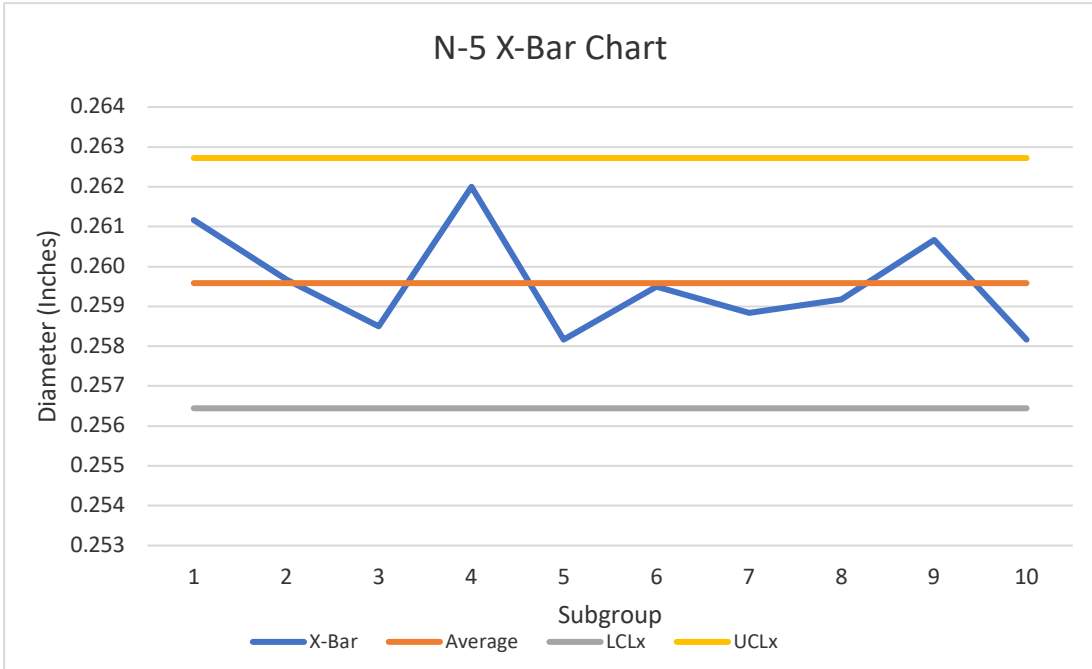
**N-5 Grouped Data Analysis:**

X-Bar	Range	R-Bar	Average	UCLx	LCLx	UCLr	STD. DEV.	Cp	Cpk	Kurtosis	Skewness
0.261	0.008	0.0065	0.260	0.263	0.256	0.013	0.00253	0.6597	0.8686	-0.02912	0.16317
0.260	0.007	0.0065	0.260	0.263	0.256	0.013	0.00253	0.6597	0.8686	-0.02912	0.16317
0.259	0.008	0.0065	0.260	0.263	0.256	0.013	0.00253	0.6597	0.8686	-0.02912	0.16317
0.262	0.006	0.0065	0.260	0.263	0.256	0.013	0.00253	0.6597	0.8686	-0.02912	0.16317
0.258	0.004	0.0065	0.260	0.263	0.256	0.013	0.00253	0.6597	0.8686	-0.02912	0.16317
0.260	0.006	0.0065	0.260	0.263	0.256	0.013	0.00253	0.6597	0.8686	-0.02912	0.16317
0.259	0.005	0.0065	0.260	0.263	0.256	0.013	0.00253	0.6597	0.8686	-0.02912	0.16317
0.259	0.004	0.0065	0.260	0.263	0.256	0.013	0.00253	0.6597	0.8686	-0.02912	0.16317
0.261	0.009	0.0065	0.260	0.263	0.256	0.013	0.00253	0.6597	0.8686	-0.02912	0.16317
0.258	0.008	0.0065	0.260	0.263	0.256	0.013	0.00253	0.6597	0.8686	-0.02912	0.16317
Average:	0.260	0.0065									

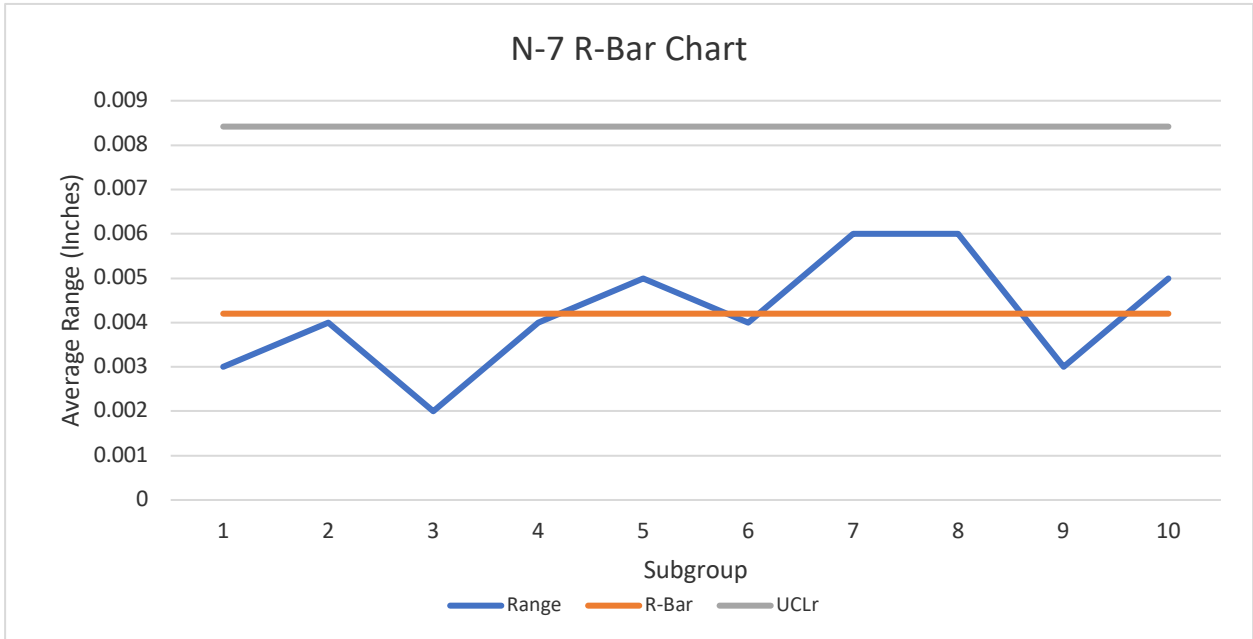
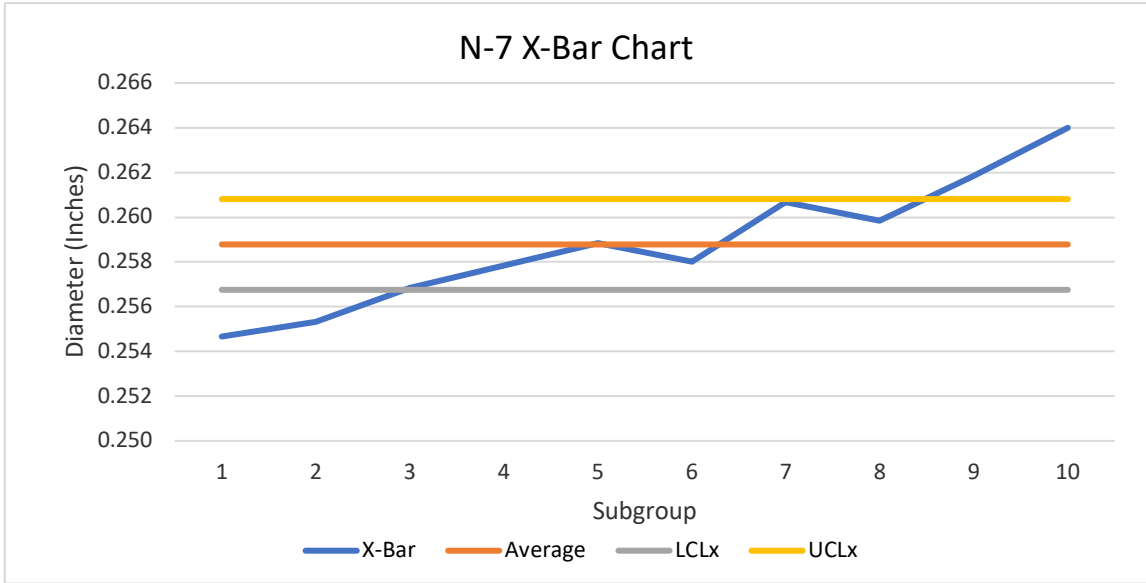
**N-7 Grouped Data Analysis:**

X-Bar	Range	R-Bar	Average	UCLx	LCLx	UCLr	STD. DEV.	Cp	Cpk	Kurtosis	Skewness
0.255	0.003	0.0042	0.259	0.261	0.257	0.008	0.003125	0.5333	0.6169	-0.3466	0.37696
0.255	0.004	0.0042	0.259	0.261	0.257	0.008	0.003125	0.5333	0.6169	-0.3466	0.37696
0.257	0.002	0.0042	0.259	0.261	0.257	0.008	0.003125	0.5333	0.6169	-0.3466	0.37696
0.258	0.004	0.0042	0.259	0.261	0.257	0.008	0.003125	0.5333	0.6169	-0.3466	0.37696
0.259	0.005	0.0042	0.259	0.261	0.257	0.008	0.003125	0.5333	0.6169	-0.3466	0.37696
0.258	0.004	0.0042	0.259	0.261	0.257	0.008	0.003125	0.5333	0.6169	-0.3466	0.37696
0.261	0.006	0.0042	0.259	0.261	0.257	0.008	0.003125	0.5333	0.6169	-0.3466	0.37696
0.260	0.006	0.0042	0.259	0.261	0.257	0.008	0.003125	0.5333	0.6169	-0.3466	0.37696
0.262	0.003	0.0042	0.259	0.261	0.257	0.008	0.003125	0.5333	0.6169	-0.3466	0.37696
0.264	0.005	0.0042	0.259	0.261	0.257	0.008	0.003125	0.5333	0.6169	-0.3466	0.37696
Average:	0.259	0.0042									

According to the Group Data Analysis that was performed on both processes, process N-5 does appear to be more capable than process N-7. Both of the processes are less than the recommended 1.33, there they both do not appear to be capable. Below are the Range and Average Charts. And below them are the calculated  $C_p$  from the charts.



Cp from Chart	
0.6497	



Cp from Charts	
1.0056	