

# Process Capability Study

**PURPOSE:** This spreadsheet is designed to handle up to 150 data observations for process capability analysis. **Verify / enter information or data in light yellow-shaded cells.**

<b>Supplier Name:</b> _____	<b>Supplier#:</b> _____	<b>Study Date:</b> _____
<b>Item / Part Number:</b> _____	<b>Revision:</b> _____	<b>Study Performed by:</b> _____
<b>Feature/Process Description:</b> _____		<b>Gage Used to Perform Study:</b> _____
<b>Specification:</b> _____ <b>0.8500</b>	<b>Tolerance: Tol(+)</b> = _____ <b>0.0005</b>	<b>Tol(-)</b> = _____ <b>0.0005</b> <b>Units:</b> <b>Inch</b>

MEASUREMENT DATA															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	0.8496	0.8500	0.8497	0.8502	0.8500										
2	0.8498	0.8497	0.8497	0.8500	0.8499										
3	0.8497	0.8497	0.8498	0.8500											
4	0.8500	0.8498	0.8499	0.8500											
5	0.8498	0.8498	0.8500	0.8500											
6	0.8497	0.8498	0.8500	0.8500											
7	0.8499	0.8498	0.8498	0.8500											
8	0.8500	0.8498	0.8498	0.8498											
9	0.8499	0.8499	0.8500	0.8499											
10	0.8497	0.8500	0.8500	0.8498											
Xbar	0.8498	0.8498	0.8499	0.8500	0.8500										
R	0.0004	0.0003	0.0003	0.0004	0.0001										

**Study Notes / Comments / Special Considerations:**

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### Study Analysis:

<b>Statistical Significance/Viability Test</b> (min. 30 observations):	<b>Statistically Viable Capability Study</b>	<b>Number of readings (n):</b> <input style="width: 50px;" type="text" value="42"/>
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Although not explicitly required, process charts and graphs (run charts, Xbar & R charts, histogram graphs, etc..) can be very helpful in analyzing process performance and be may be included with the Process Capability Study.

**Spec Limits**

Formulas: **USL = NOM + Tol(+)**      **LSL = NOM - Tol(-)**

<b>Upper Spec Limit (USL):</b>	0.8505	Process within USL	<b>Readings above USL:</b> <input style="width: 50px;" type="text" value="0"/>
<b>Nominal (NOM):</b>	0.8500		
<b>Lower Spec Limit (LSL):</b>	0.8495	Process within LSL	<b>Readings below LSL:</b> <input style="width: 50px;" type="text" value="0"/>

**Xbar**

Formulas: **UCL = Xbar + 3s**      **LCL = Xbar - 3s**       $s = \sqrt{\frac{\sum(x - \bar{x})^2}{n - 1}}$       n = number of data readings

<b>Upper Control Limit (UCL):</b>	0.8503	Process within Xbar UCL	<b>Readings above Xbar UCL:</b> <input style="width: 50px;" type="text" value="0"/>
<b>Mean (Xbarbar):</b>	0.8499		
<b>Lower Control Limit (LCL):</b>	0.8495	Process within Xbar LCL	<b>Readings below Xbar LCL:</b> <input style="width: 50px;" type="text" value="0"/>

**R**

Formulas: **UCL = Rbar + 3s**      **LCL = Rbar - 3s**       $s = \sqrt{\frac{\sum(R - \bar{R})^2}{n - 1}}$       n = number of data readings

<b>Upper Control Limit (UCL):</b>	0.0007	Process within R UCL	<b>Readings above R UCL:</b> <input style="width: 50px;" type="text" value="0"/>
<b>Mean (Rbar):</b>	0.0003		
<b>Lower Control Limit (LCL):</b>	0.0000	Process within R LCL	<b>Readings below R LCL:</b> <input style="width: 50px;" type="text" value="0"/>

**Process Capability Index**

Formulas:

$$C_{pk} = \min\left(\frac{USL - \bar{x}}{3s}, \frac{\bar{x} - LSL}{3s}\right)$$

$$C_p = \frac{USL - LSL}{6s}$$

Standard Deviation (s) =

**C<sub>p</sub> = 1.274      C<sub>pk</sub> = 0.984**

**Study Results: Unacceptable process capability.**