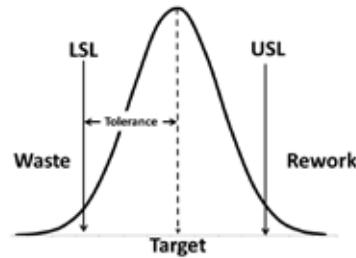


Process Capability Analysis

Process capability determines if a process will deliver a product or service that meets the customers requirements.

Customer requirements are defined using an Upper Specification Limit (USL) and a Lower Specification Limit (LSL).



A process has to be stable before it can be determined to be capable.

Process Capability Metrics

Cp - Capability Index

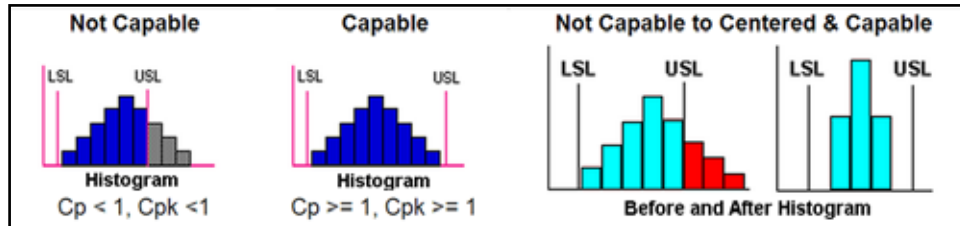
Measures how well the data fits between the USL and LSL.

$Cp \geq 1.33$ is desirable

Cpk - Centering Capability Index

Measures how well the data is centered between the USL and LSL.

$Cpk \geq 1.33$ is desirable



Don't Confuse Cp Cpk with Pp Ppk

Cp, Cpk (Capability Indices)

- Use when you have a sample and are testing the potential capability of a process.
- Cp Cpk use sigma estimator.

Pp, Ppk (Performance Indices)

- Use when you have the total population and are testing the performance of a process.
- Pp Ppk use standard deviation.

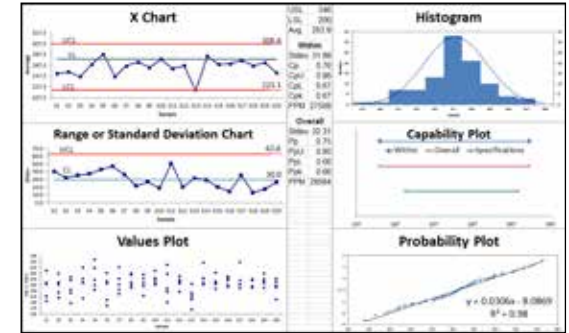
Learn more: www.qimacros.com/training/videos/capability-suite/

Process Capability Tools in the QI Macros

Capability Suite of Six Charts

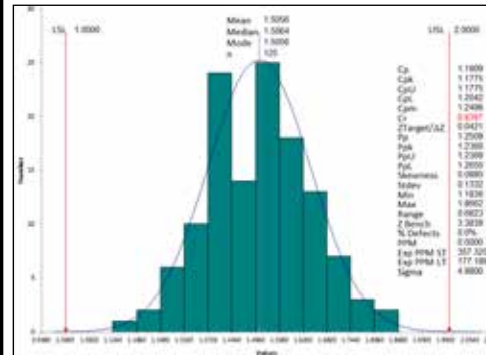
Use the Capability Suite or the X Chart Templates to Evaluate:

- Process Stability using Control Charts
- Process Capability using Histogram with Cp Cpk, Capability Plot, Values Plot
- Data Normality using Probability Plot



Histograms with Cp, Cpk, Pp, Ppk

- Select your data, and then the Histogram with Cp Cpk from the QI Macros menu.
- Draws the chart and does all the calculations for you.
- Interactive results allow you to change: USL, LSL, number of bars, and bin intervals.



Cp, Cpk Template

Calculates Cp, Cpk, Pp, Ppk capability metrics for multiple data sets, side-by-side.

Just drop in your data and your customers' specification limits.

Characteristic	S 1	S 2	S 3	S 4	S 5
Target	1.500	1.500	1.500	1.500	1.500
LSL	0.500	0.500	0.500	0.500	0.500
USL	1.750	1.750	1.750	1.750	1.750
Min	1.250	1.250	1.250	1.250	1.250
Max	1.750	1.750	1.750	1.750	1.750
Mean	1.250	1.250	1.250	1.250	1.250
USL - LSL	0.500	0.500	0.500	0.500	0.500
σ	0.111	0.125	0.137	0.152	0.165
Cp	0.833	0.833	0.833	0.833	0.833
Cpk	0.798	0.801	0.804	0.807	0.810
Pp	0.833	0.833	0.833	0.833	0.833
Ppk	0.798	0.801	0.804	0.807	0.810
σ	0.111	0.125	0.137	0.152	0.165
Cp	1.191	1.217	1.244	1.271	1.297
Cpk	0.748	0.807	0.866	0.925	0.984
Pp	0.748	0.807	0.866	0.925	0.984
Ppk	0.748	0.807	0.866	0.925	0.984
σ	0.111	0.125	0.137	0.152	0.165
Sample #	S 1	S 2	S 3	S 4	S 5
1	1.504	1.413	1.614	1.457	1.601
2	1.431	1.368	1.668	1.487	1.611
3	1.256	1.241	1.260	1.250	1.232

Learn more: www.qimacros.com/control-chart/capability-suite/