

# Control Chart Cheat Sheet

## Key Concepts

- ◇ A control chart is a graph of your data with average and sigma lines to determine process stability.
- ◇ The average and sigma lines are calculated from the data.
- ◇ The upper control limit (UCL) and lower control limit (LCL) represent the  $\pm 3$  sigma lines.
- ◇ 99.7 % of your data should fall between the UCL and LCL.

### Processes Have Two Different Kinds of Variation

**Common Cause:** The natural variation that exists within any process.

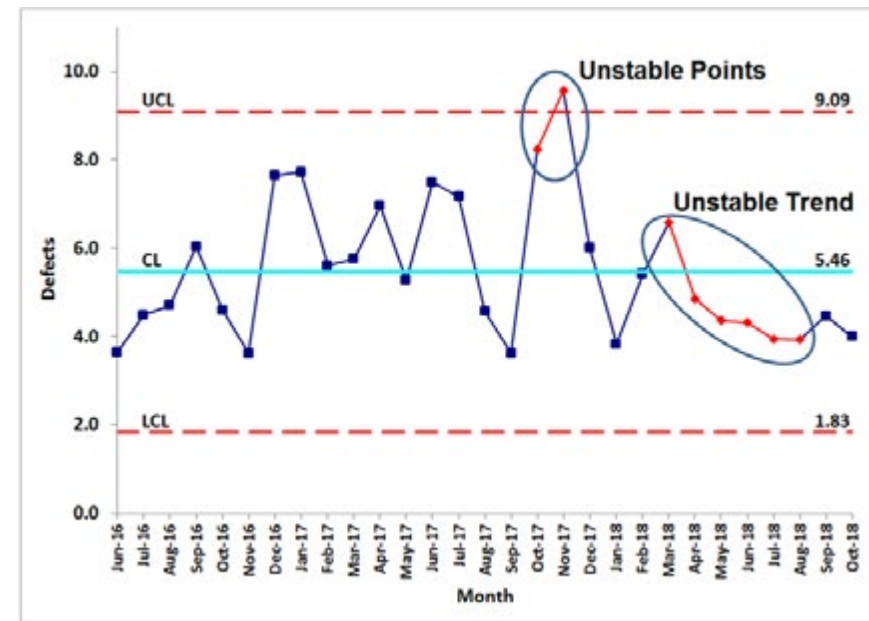
**Example:** Your commute to work takes varying amounts of time each day.

**Special Cause:** Variation that is due to something out of the ordinary.

**Example:** A construction zone, blizzard, or traffic accident.

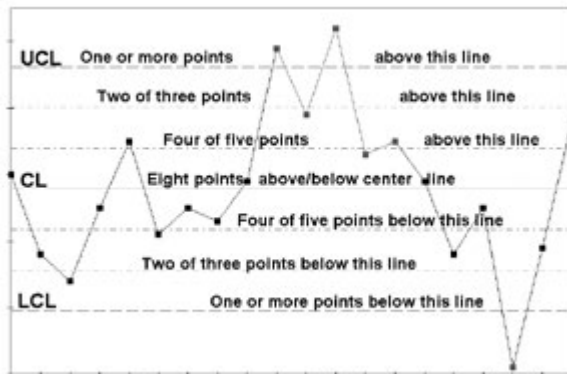
Special causes require immediate cause-effect analysis to eliminate the source of variation. Once special causes have been addressed and a process is stable, you can launch an effort to reduce common causes of variation.

## Example of a Control Chart



## Stability Analysis

- ◇ Stability analysis is designed to identify special cause variation.
- ◇ An unstable condition, can be a single point, a set of points or a trend.
- ◇ Control charts use the zones created by the sigma lines and the stability rules to analyze your data and identify unstable conditions.



## Types of Control Charts

Attribute Charts for Counted Data	Variable Charts for Measured Data
defects, errors, injuries, etc.	length, weight, depth, time, etc.
c chart p chart u chart np chart	XmR / ImR Chart (Individual Moving Range Chart) XbarR Chart XbarS Chart

### Control Charts for Special Situations

- EWMA and Cusum charts for small shifts in a process
- g charts and t charts for rare events
- Levey Jennings standard deviation chart - used in healthcare labs
- Short Run control charts when making a few parts of different sizes

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## Examples of Control Chart Tools Included in QI Macros for Excel

### Control Chart Wizard

Not sure which chart to choose?

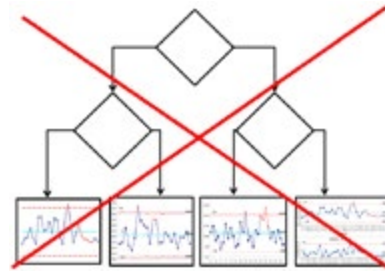
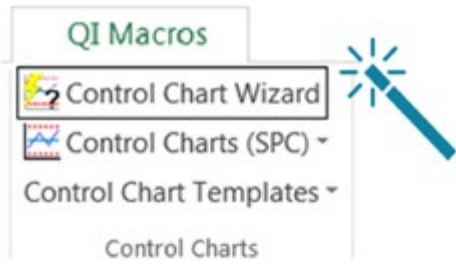
QI Macros Control Chart Wizard analyzes your data and selects the right control chart for you.



One Click Wizard

vs.

A Forest of Decision Trees

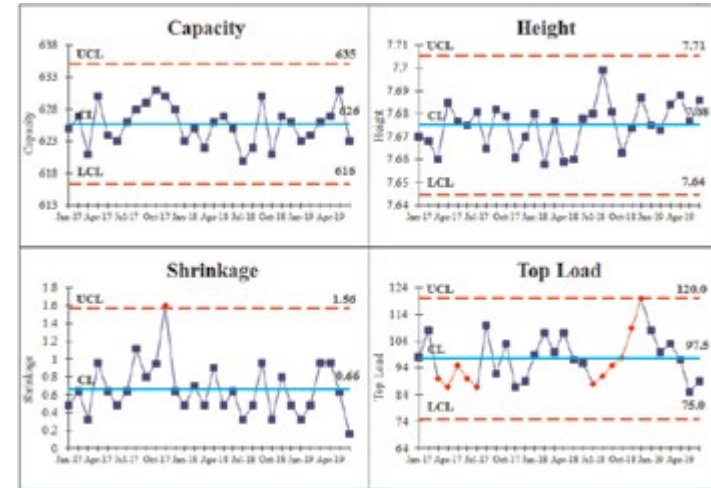


### Control Chart Dashboards

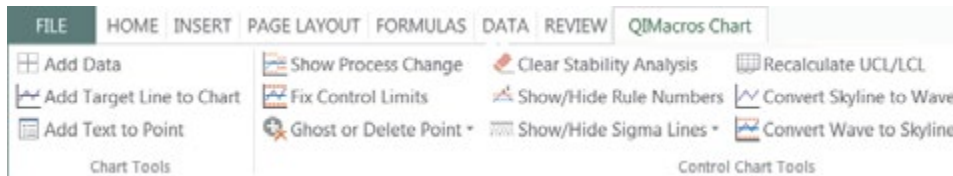
Do you update multiple charts on a regular basis?

Do you track monthly KPIs?

QI Macros Control Chart Dashboards can save you hours of time.



### Chart Menu Automates Common Tasks



- ◇ Add Data, Text or Target Lines
- ◇ Calculate or Recalculate Control Limits
- ◇ Show Process Changes with Stair Step Limits
- ◇ Run and Re-run Stability Analysis
- ◇ Display or Hide Control Limits
- ◇ Format and Share Charts

### Capability Suite of Six Charts

Analyze normality, stability and capability with one click.

