

# Statistical Process Control



Performs Statistical Process Control (SPC) using standard and user defined SPC validation rules

## Overview

Statistical Process Control (SPC) is a method of applying statistical methods and techniques in order to monitor and control a process. Using historical process data, it's possible to check whether a certain process is under control and it's possible to calculate the respective control limits, that is the Voice of the Process (VoP). If a certain process is under control, it's possible to apply rules that check for specific patterns in order to detect problems before they become visible and cause significant production issues. By combining the Voice of the Customer (VoC) with the respective specification limits, it's

possible to enrich the type of analysis and problems that be detected.

Statistical Process Control (SPC) is a pre-integrated module that is used to monitor the stability and quality of a certain process as well as to identify and flag problems as early as possible. When a problem is identified, it's possible to trigger an action such as sending an email, putting the lot on hold, or putting the equipment down. It's also possible to open an exception protocol workflow to correct the situation.

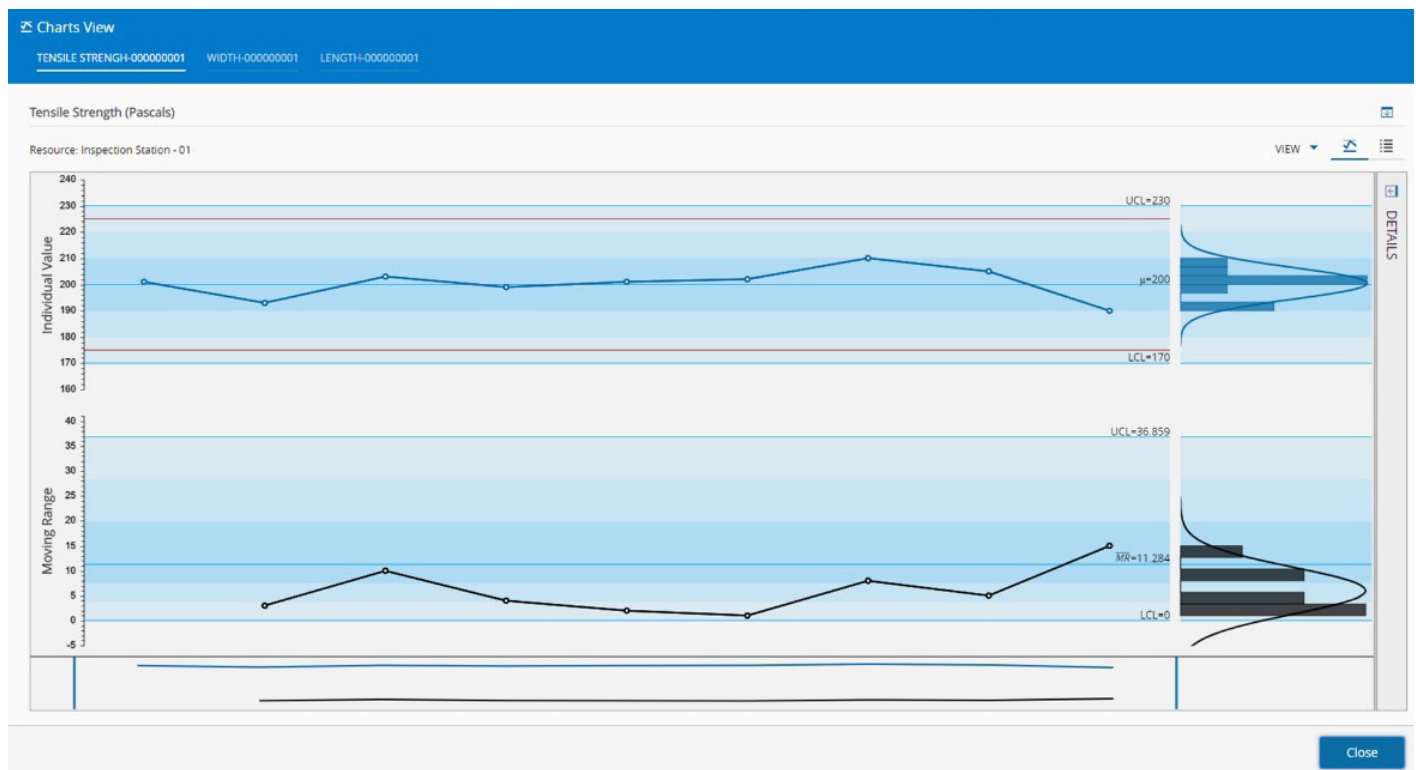


Figure 1 SPC Chart example

## Key Features

- Support for flexible Chart context definitions so that different Charts are created automatically by the system for every different context combination (e.g.: one Chart per Resource).
- Support for the following type of Charts:
  - Variable Charts:
    - Average and Range ( $\bar{X}$  R)
    - Average and Standard Deviation ( $\bar{X}$  s)
    - Median and Range ( $\bar{X}$  R)
    - Individual and Moving Range (I-MR)
  - Attribute Charts:
    - Fraction Defective (p)
    - Number Defective (np)
    - Average number of Defects (u)
    - Number of Defects (c)
- Capability of setting the specification limits directly at the Chart level or to inherit them automatically from the Product definition which is subject to change control.
- Support for automatically calculated or manual control limits.
- Support for learning mode capability, where the system will collect data and set the control limits automatically after a certain number of data points.
- Support for Nelson rules
- Support for Western Electric rules
- Support for user-defined rules.
- Support for posting data points with the data summary without the need to posting data about the individual readings.
- Real-time, online Chart visualization by the operators.
- Capability to annotate, exclude, include, edit and delete data points.
- Online graphical Chart visualization with time filters.
- Capability to view the Chart as a graph or as a data table.
- Online visualization of multiple Chart and data point statistical indicators (e.g.: Cp, Cpk, Cp, Median).
- Capability to open automatically an exception protocol workflow in case of a SPC violation.
- Capability to trigger any action such as sending an email, putting the lot on hold or putting the equipment down in case of a SPC violation.
- Capability to define when the SPC chart should be displayed or acknowledged by the user (always, never, only when a violation occurs).
- Integration with Material Tracking, Resource Tracking, Data Collection, Maintenance Management and Exception Management.

## Benefits

- Reduction of scrap, rework, and customer complaints
- Improved equipment utilization
- Increased operational efficiency
- Reduction of costs
- Reduction in the opportunity for errors
- Improved client satisfaction

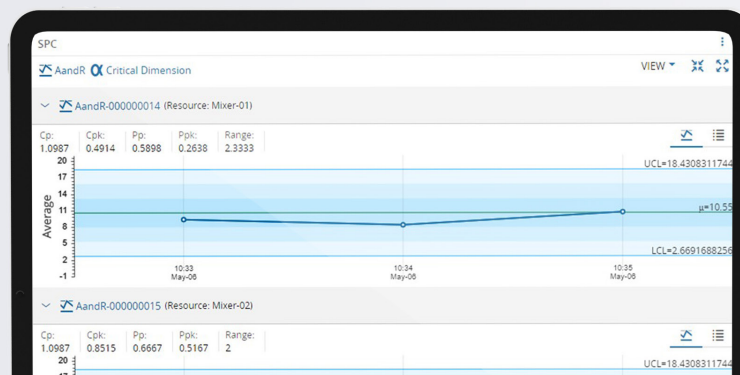


Figure 2 SPC Charts widget for off-line analysis