

LabSpeed Standard SPC

A LabSpeed Feature Add-in from Topos Technologies

Overview

Standards SPC is a LabSpeed Feature add-in that provides automated statistical process control for control standards. Standards SPC may be applied to any instrument in the lab for which LabSpeed has a database Add-in.

Features include:

- Upper and lower control limits (mean +/- 3-sigma) are automatically calculated from a selected list of previous control standard analyses.
- Control standard samples are monitored as the instrument is run. Results are evaluated in real-time against pre-defined rules, and a Pass / Fail status is automatically displayed.
- Results may be analyzed using X/Bar and X/Bar-MR charts.
- Historical evaluations may be retrieved for later analysis.

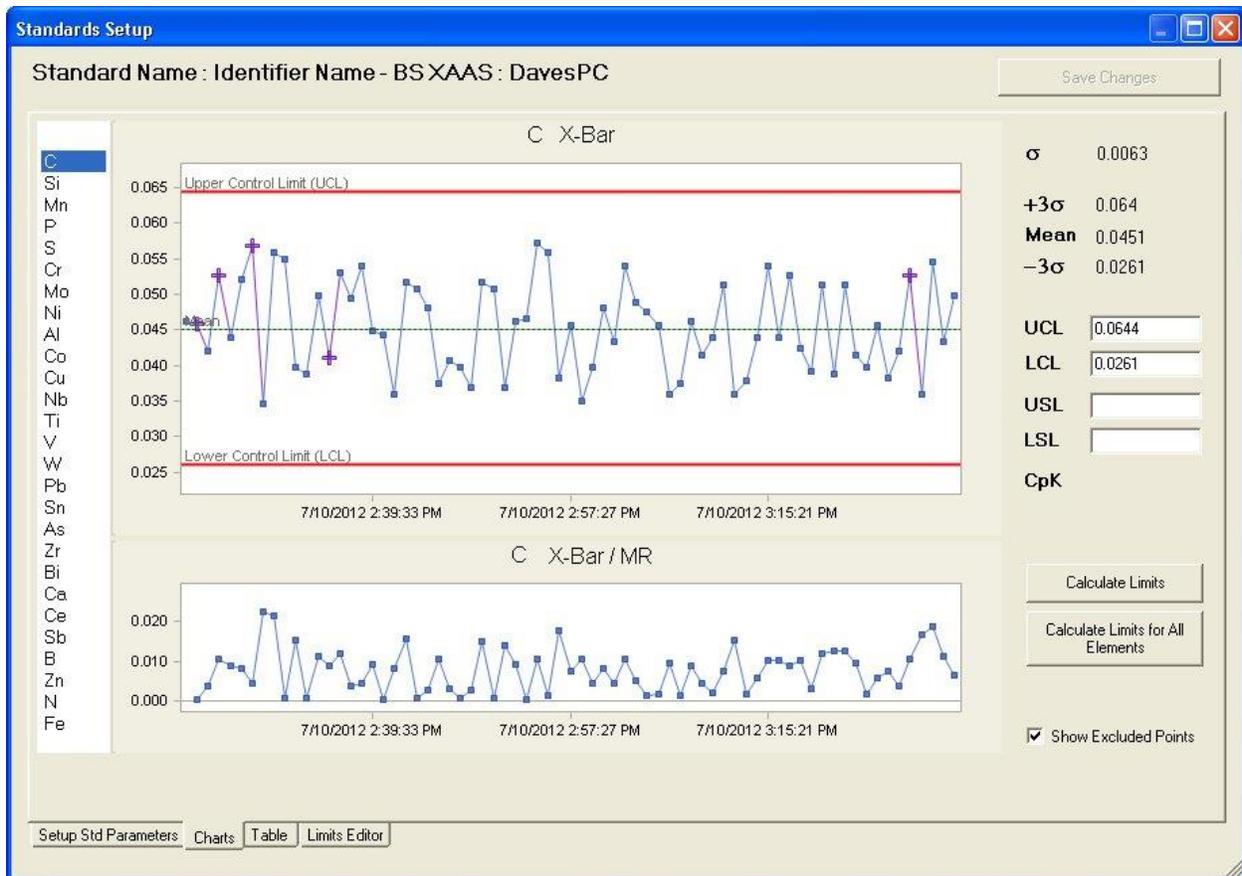
All monitor and setup properties, evaluations and calculated limits are stored to the Topos SQL Server database for easy recall. Any LabSpeed instance running, either at the instrument or remotely that has permission to access the SPC results may be used as a setup and evaluation platform, freeing valuable instrument time.

Note: The term “element” used in this document refers to any analyzed constituent in a control sample, depending on the instrument and type of result.

Calculating Upper and Lower Control Limits (UCL/ LCL)

Control limits at standard deviation values between 1 and 6-sigma above and below the mean are calculated automatically for all analyzed elements in a control standard from stored standard data. Specific samples or elements may be excluded from the calculation. Control limits and specification limits may also be manually entered. Once finalized, the limits and all associated parameters may be "locked" to prevent changes.

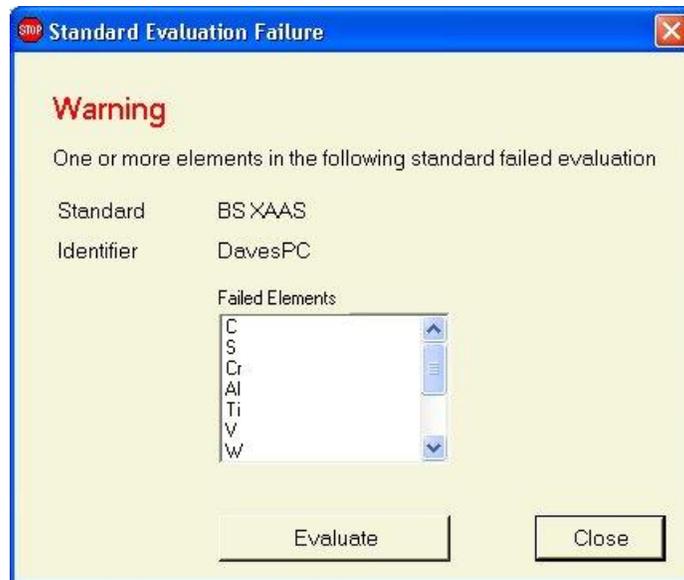
In a typical scenario, the operator will select a control standard from the instrument database and create a SPC record for it. A range of samples is selected to use for generating the limits and a target sigma value selected. Using interactive statistical X-Bar and X-Bar/MR charts as a guide, the operator can choose to calculate limits for all elements, or for a single element. The calculated UCL and LCL values may be manually entered to override the calculated values. Samples and points may be excluded from the calculation by right-clicking on a point in the chart and entering required notes. All changes are saved to the Standard SPC database for later recall and future modification.



Real Time Monitoring

Control standards from multiple instruments of the same or different instrument type may be monitored and evaluated against different failure rules simultaneously and in real-time. An operator may create one or more Monitor records, which specify the evaluation rules and failure alert options. When the monitor "Starts", it automatically evaluates control standards as they are saved and provides instant feedback to the operator should a failure occur.

Monitor and Rule Evaluation Status											
Monitor Start/Stop	Monitor Name	Monitor Identifier	Instrument	Sample Standard	Sample Identifier	Sample Date/Time	Evaluation Status	Total # Evaluations	Evaluation History	Messages	Evaluate Results
Running / Stop	Spark1 Monitor	DavesPC	Spectro_Spark	BS XAAS	DavesPC	7/27/2012 5:33:58 PM	FAIL	3	Show History	0 - Messages	Evaluate
Stopped / Start	Spark2 Monitor	XP-VISTA3	Spectro_Spark					0	Show History	0 - Messages	Evaluate



Evaluation Rules and Number of Samples

Besides the standard rule of exceeding the defined upper and lower control limits, Standard SPC includes Nelson and Western Electric (WECO) rules, which check for randomness and trends in the data. Most Nelson and WECO rules require 2 or more consecutive points of data in order to evaluate the rule.

Historical Evaluations

Every time a standard is evaluated, the results are stored to the Standards SPC database along with any user-entered notes and exclusions. Evaluated sessions and optionally un-evaluated samples may be re-loaded for analysis and additional modifications can be made.

Failures at the element level may be highlighted for the last sample in the list, or for all samples in the list. Excluded points may be hidden or displayed resulting in an automatic chart re-scale.

