

# AqTools™ Software for the statistical analysis and management of Control Samples & their results

## Routine Analysis of Control Samples

The most effective way of monitoring the performance of a specific analysis is to regularly use control or spiked samples (also called Analytical, Internal, External quality assessment or proficiency testing samples) which have independently verified results. Once included at regular intervals during testing they can be used to flag discrete changes in analysis performance which may be leading to over, or under reporting of true result values. While simple flagging against a target value is straightforward, the tools used to identify trends use specific statistical rules and need access to historical data. e.g. trend rules are often referred to as Westgard rules but statistics also include bias and uncertainty of measurement.

As an alternative to custom programs, large numbers of spreadsheets or embedded functions in LIS/LIMS systems to perform these statistical calculations, CSols have developed a new dedicated software tool to handle all aspects of control sample processing, called **AqTools**.

## AqTools design

**AqTools** is a PC application and can be used with all types of laboratory tests. It can be purchased for a single workstation and easily expanded to further workstations to create a multi-user system with a single cohesive shared database.

**AqTools** has two components.

- A graphical user interface for easy navigation and access to a range of functions like manual and spreadsheet data entry, analysis, charting, management of exceptions, limit management, security access and reporting and
- A dedicated database to store all current and

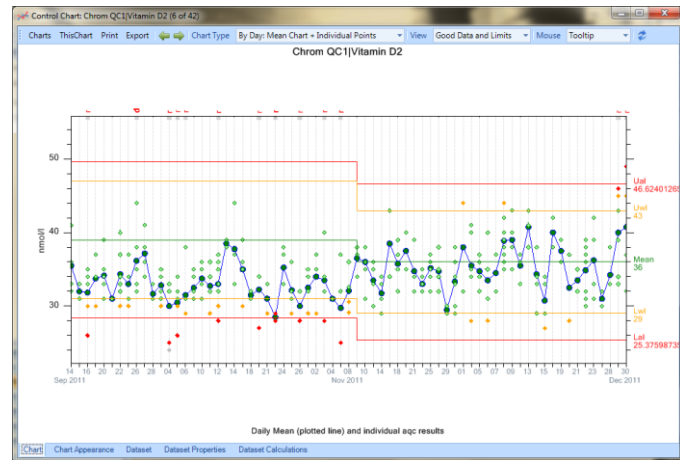


Figure 1: A control Chart of QC results with date on the x axis showing different historical limits, exceptions and excluded data points

historical results, limits and exceptions

**AqTools** makes full use of either Microsoft's SQL Server or Oracle's relational database management software to provide a reliable, robust and secure store for all data being created. This means that it can be easily scaled up to suit larger enterprises be linked to LIS/LIMS, and other IT systems.

## Day to day use

**AqTools** is configured by creating '**AQC Ids**'. These can represent external or internal QC types, spikes, blanks or duplicates, in fact any results type that requires charting.

## Charting

Control charts can be viewed in the Shewart format with different x and y axis options including the display of run numbers, batch or dates showing individual and mean results. Results falling into the warning and action limits ranges are colour coded and charts are automatically updated with configurable result 'r' or daily 'd' trend exceptions that are determined using configurable rules.

## Convenient Manual & Instrument data entry

**AqcTools** is provided with two mechanisms for manual entry. The first is a simple screen which prompts for results for a specific AQC ID. The other mechanism is via Excel template. With this function it's possible to easily build any number of templates for fast and convenient entry of results for single or multiple control samples at once. The same mechanism can be adapted to suit instrument data entry where control samples results can be pasted directly from instrument output files.

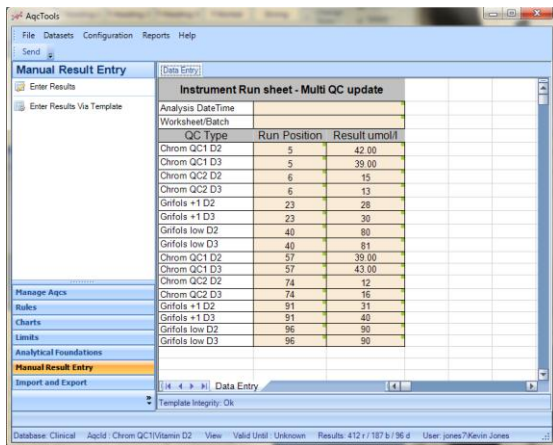


Figure 2– Entering result values for several control samples type via template

## Auditing of Limit changes & Data Exceptions

**AqcTools** uniquely provides analyst or quality managers the ability actively manage limit changes as well as to record the actions taken to investigate exceptions. All changes are audited to assist with full internal procedures and hence allow simplified review by accreditation bodies.

### Access to Historical data

Charts are normally displayed with a default number of points. However users also have the option to select date ranges

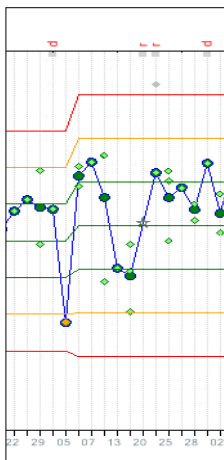


Figure 3 – Control chart showing both individual and mean result with 'r' result and 'd' daily trend exceptions

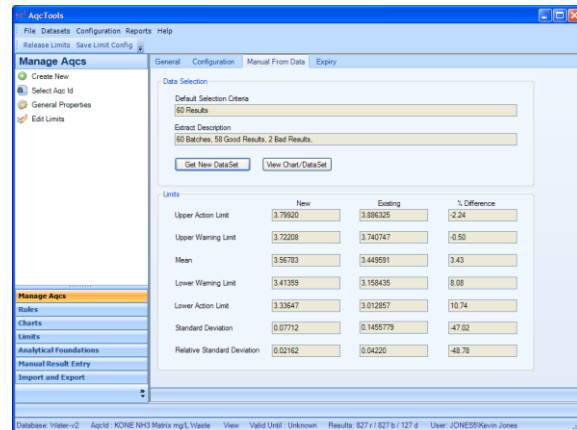


Figure 3 – Control limits can setup manually or automatically and updated using stored results and so have access to the entire historical data set per AQC ID if required. A series of predefined trend and exception reports are also provided to help investigate long term changes. The database can also be accessed for user created reports for full flexibility of reporting.

## Security & Integration

The robust database architecture also gives laboratories a range of security options. Each user may have a specific role and may only access and update AQCs that are relevant to them, making sure only authorized staff perform key functions like limit changes. Import options allow the convenient entry of legacy data and integration from LIS/LIMS and **AqcTools** can be fully integrated with **Links for LIMS** for 'hands free' data entry.

## Summary

**AqcTools** provides a convenient, cost effective and dedicated mechanism for users to easily manage control samples and can be scaled up to provide a complete independent system that full supports accreditation. For further information or a demonstration of **AqcTools** please contact CSols at:

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