LABWORKS LIMS Solutions
Chemical Industry

Real-time trending helps improve chemical plant process control

Ethyl Corporation of Pasadena, Texas, implemented a LIMS that automatically plots test results in an intuitive graphical format allowing operators and supervisors to keep their fingers on the pulse of the process. The new LIMS also helps the laboratory or plant personnel to determine the status of any sample in seconds and helps the laboratory manage its backlog.

"The ability to monitor plant processes significantly improved since we installed the new LIMS," said Paul Cook, Laboratory Coordinator for Ethyl Corporation. "We made other improvements simultaneously so we can't attribute the entire improvement to the LIMS but it's clear that it made a significant contribution."

Ethyl develops, manufactures, blends and delivers leading-edge additive technology for fuels and lubricants around the world. The company produces fuel additives engineered to improve the performance of gasoline, diesel and other fuels. The company also makes lubricant additives that help protect engine and other moving parts from wear, deposits, corrosion, water and high operating temperatures.

Key Benefits

- Automatic Trend Plotting eliminates manual plot creation.
- Quick upgrades for lower cost of ownership
- Process Scheduler saves time with automatic viewing of sample statuses.

PerkinElmer®
precisely.

Trend plots were manual in the past

Statistical process control data is an important part of day-to-day decision making in the plant. The ability to gather and efficiently organize this data has become increasingly important.

The Ethyl plant originally shared the cost of a host-based LIMS with several corporate siblings. The system provided basic functionalities but nothing close to the real-time plotting capabilities the company is receiving now. The results of the tests were printed on paper reports and sent to unit operations for recording and plotting on paper charts. Laboratory statistical quality control checks were also maintained manually. Manual maintenance of statistical quality and process control charts required additional time.

The Ethyl team decided to upgrade the LIMS and they chose the PC version of LABWORKS™, from PerkinElmer®, Inc., Shelton, Connecticut. LABWORKS was chosen because it is a configurable product that is designed to meet the needs of chemical plant laboratories, without the need for customization. The LIMS provides build-in tools that adapt the software to any laboratory processes. This made it possible to upgrade the system in just three days with minimized disruption of plant operations.

Move to automated trend plotting

"The main reason we decided to do the upgrade was to take advantage of the online plotting program," Cook said. The LABWORKS Trend Plot program provides users with the ability to graphically display series of result values for groups of selected parameters and location codes in real time. These trend plots can be used by personnel outside the laboratory for tracking manufacturing or environmental processes in a plant or by workers in the lab for tracking instrument performance and calibrations. "We configured the software to show alarm limits and specification limits in different colors on the plots," Cook said. "The trend plots are automatically updated every time a sample is analyzed. The result is we can see at a glance if we have a problem or if we are heading for a problem in a few hours while there is still plenty of time to correct it. Just as important, we can view key parameters over time to get an idea of where we are headed."

Ethyl has set up five or six plots for supervisors and process operators in each of the company's four production units. They configured the software to automatically scan from plot to plot, making it possible to instantly review trends. The intervals between tests vary within the production units. The continuous units might receive data every six hours while the blending units, which operate in batch mode, only get data at the end of a batch. "Our objective in implementing trend plotting was to improve our process capabilities by getting a better understanding of the variation in our process," Cook said. The new tool provides far more information than we had in the past and it also saves us time by eliminating the need to create plots manually."

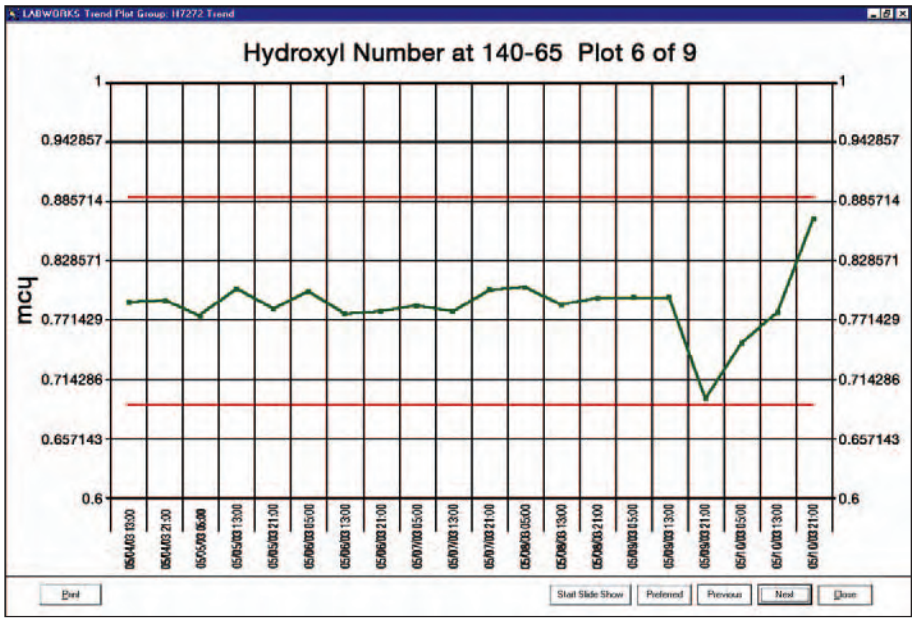


Figure 1. Although all of these points are within the limits, this sharp change might warrant some communication. The last point on the right is from the last sample analyzed. One can easily obtain all of the information associated with this sample from the Process Scheduler.

Streamlined laboratory workflow

The laboratory workflow proceeds as follows:

1. Unit operations deliver the samples on a defined schedule.
2. Each sample has a unique unit code. This unit code is defined in the LIMS with all the required test parameters and specification limits. When an analyst receives a sample, he or she enters the unit code, date and time and all the test parameters for the sample are quickly displayed.

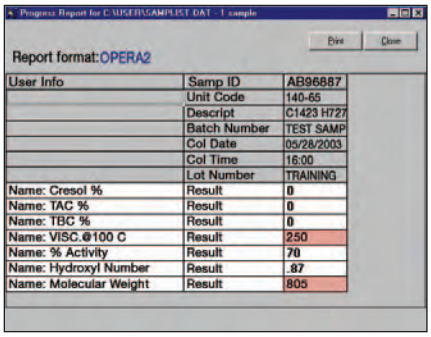
3. As a test is completed an analyst enters the result.
4. When all the tests are completed, the analyst validates the results.
5. At any stage the operating unit can see the status of the sample through the Process Scheduler. As results are saved, the value is also displayed on the trend plots.

Process Scheduler saves time

Cook said the LABWORKS Process Scheduler provides a window into the status of every sample in the laboratory. "If we have a sample that's a high priority and want to know the status, we simply click on it and see at a glance exactly where it is," Cook said. "Or we can generate a list of samples that are waiting for analysis or waiting for validation. The units have the Process Scheduler which also saves an untold number of phone calls back and forth to check on the status of a high priority sample. Each unit is set up to see only their department's samples. We could get this information from our system but it took a lot more time and it was not available at the unit level, which meant significantly more phone calls. The Process Scheduler also serves as a valuable tool for laboratory management. We can easily see the entire backlog and evaluate how it stacks up against available resources. I also use the Statistical Quality Control module on a regular basis to generate all kinds of quality control and quality assurance charts."

"We implemented trend plotting in the new version of LABWORKS to make sure the people responsible for these parameters knew where they were at any minute. When we got the trend plots working, it was clear that putting this information at our fingertips made a significant difference in gaining control over our process and continually reducing variation."

For more information about PerkinElmer and LABWORKS, please visit the company's website at *www.labworks.com* or call 1.800.762.4060.



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Name: TBC %	Result	0
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Name: % Activity	Result	70
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Name: Molecular Weight	Result	805

Figure 2. The red fields indicate out of spec results. Left-click on any of the results for more details, specs, comments, or a history of results.

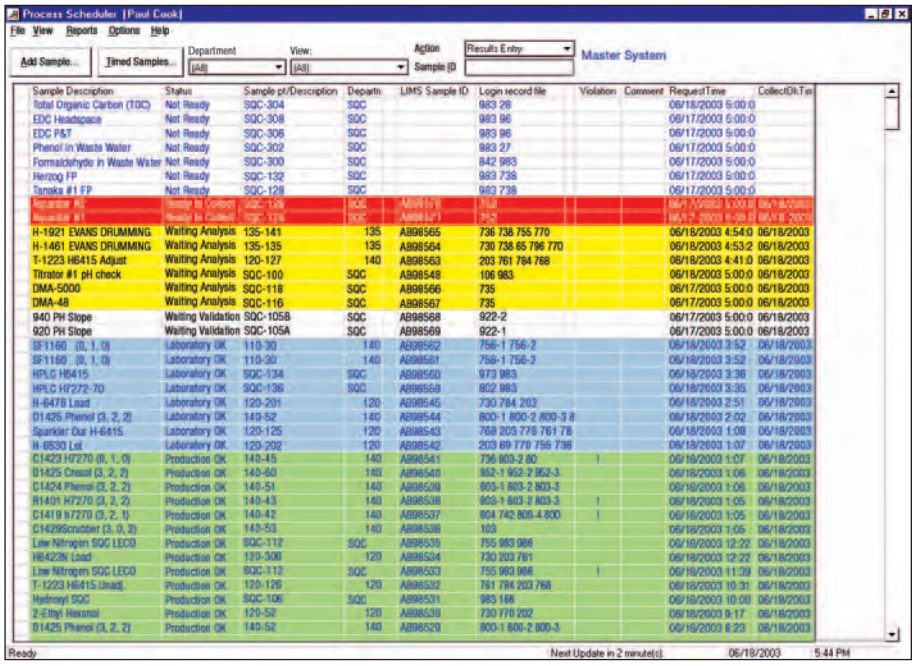

Figure 3. A closer look at the same view reveals:

- The lab has a backlog of 6 samples as indicated by yellow shading. T1223 is waiting for at least one test. Other results for T1223 might already be complete and accessible. The lab has been instructed to save results ASAP so they will appear on trend charts and be available for viewing.
- The lab has finished with the samples beginning with the blue SF1160 and below.
- The first sample in green, the C1423, has had a limit violation indicated by the exclamation point in the violation field.

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