

Portable Parallel Analyzer Reduces Processes, Improves Grab Sample Analysis Time by 75%

Problem

Grab sample testing and analysis for a third-party operational partner serving refinery and petrochemical companies took 30-40 minutes for each parameter. Pulling 27 samples from all required sampling points, the service provider struggled with prolonged testing periods. Inefficient testing methods put extra stress on technicians and took their time away from working directly with customers and reduced how many clients technicians could visit weekly.

Solution

The service provider tested the Hach® SL1000 Portable Parallel Analyzer™ (PPA) with the hopes of reducing time spent on testing all required water quality parameters without sacrificing accuracy. The SL1000 analyzes up to six parameters simultaneously, making testing faster. Also, by eliminating zeroing, shaking, and other manual processes, the SL1000 reduces variability and cumbersome tasks associated with grab samples.

Benefits

During the SL1000 demo, the service provider reduced the time spent on sampling and testing from 40 minutes to 8 minutes per parameter. Whereas complete testing at the site used to take 16-18 hours, the SL1000 decreased this by 75% while reducing the potential for human error during testing.

Background

A third-party operations partner serving oil and gas companies across the world helps its clients make the most of their fuel reservoirs. Within its water quality testing services, the company offers anything from troubleshooting to spot-checking to complete operational support for clients.

Due to the size and complexity of its client's facility, the time it took to complete grab sampling and testing created issues with delivering analysis results back to the customer promptly. This site required the service technician to pull samples from 27 sampling sites, including seven feedwater sites, seven boilers, and a mix of condensate and steam traps.

Parameters included:

Feedwater: hardness, alkalinity, iron, pH, conductivity

Boilers: alkalinity (up to 700 ppm), pH, conductivity. This was a polyphosphate program. The service partner also ran orthophosphate to check for breakdowns.

Condensate: iron



CASE STUDY: SL1000 PORTABLE TESTING FOR CHEMICAL/PETROCHEMICAL

With 27 sample sites and each grab sample taking approximately 30-40 minutes for testing, finishing water quality testing would require up to 16-18 hours. The operations partner wants its technicians to offer more than testing and analysis for clients—it wants to be an operational and strategic partner for all clients. But, with some customers requiring multiple site tests every week, it becomes difficult to do anything other than testing and reporting due to lengthy, cumbersome grab sample processes.

To improve operations, the company wanted a new solution to help technicians report sample analyses more quickly. This would open opportunities for technicians to visit more sites and spend more time working directly with customers.

Solution and Improvements

Having worked with Hach products over the last 20 years, one of the service operation partner's Business Development Managers decided to test the SL1000 in hopes of streamlining grab sample testing. "I've always been looking for something to reduce time in the lab," she said. "I've known my Hach rep since 2005. When she called me about the SL1000, she knew I'd be interested."

Testing Simplified

With the SL1000, technicians can perform up to four colorimetric tests at the same time with a single sample using Hach Chem-key® reagents that are inserted right into the SL1000. Also, two probe-based measurements can be tested with Intellical™ probes—making it possible to test up to six parameters simultaneously. At one particular facility's feedwater sites, Business Development Manager said she was able to quickly test for pH, conductivity, hardness, and iron at the same time. "The fact that you can run tests simultaneously is wonderful. I just stuck the four Chemkeys in, took the sample, hit run, and did pH and conductivity while they ran," said the Business Development Manager. "It is very easy to execute. I can measure quickly and make adjustments faster, in a timely manner."

Being able to rapidly turn the SL1000 measurements into actionable analysis helps the technician meet any of her client's permit requirements and better avoid issues like scaling, fouling, and corrosion. Expediency is also important for compliance reporting: If a facility has an on-site wastewater treatment plant, the technician is able to make adjustments more quickly to meet regulatory requirements for key parameters such as orthophosphate, ammonia, pH, conductivity, etc.

Subjectivity Solved

A handful of processes, such as zeroing, mixing, and shaking, are not required to perform tests with the SL1000, making results less subjective and more consistent for all operators. "Whenever you're running boiler samples, one of the keys to analysis is alkalinity," she said. "In general it's a titration test. Each titration takes a few processes, and no two people do that the same way. Colors are subjective. The height of a person comes into play, especially when you're looking at a burette. Temperature comes into play. The SL1000 takes uncertainty of people out of the measurement."



Hach SL1000 and all the operator's required testing parameters included in a single carrying case.

In addition, the SL1000 allows operators to transfer data straight from the device to a computer. This functionality helped give the technician a greater sense of confidence in the data compared to manually transcribing data. "Is this a six? A zero? A Two? The less time you touch data, the more accurate it stays," said the Business Development Manager. "The fact you can download results to a spreadsheet with the SL1000 and cut/paste is very nice."

Decluttering test kits

Designed for portable testing, the SL1000 reduces the need for tackle box test kits overloaded with test tubes, powder pillows, burettes, and other instruments. During the demo, the technician was able to reduce her equipment from a trunk full of water testing equipment to just the SL1000 and its reagents. "That's another reason for happiness right there," she said. "I'm able to carry everything I need for the day in one case, and it's not that heavy. I used to have a 15-pound tackle box of pillow packets and test tubes. The SL1000 makes it so much easier. I just do what I need to do on-site, and occasionally I send a detailed water sample to the lab."

Conclusion

The SL1000 demo lasted three weeks. In that time, the technician was able to reduce up to two days' worth of testing to a fraction of the time. The Business Development Manager commented:

“Instead of taking one boiler sample or makeup for feedwater where initially you would need 30 minutes for analysis, it’s shrunk to 10 minutes for all parameters. The sheer time to do the analysis—orthophosphate, alkalinity, pH, conductivity, hardness—all these things take time. I ran 27 samples and if you take those and run six analyses individually, you would be in the neighborhood of 30 to 40 minutes per sample. The SL1000 consolidates this into one time period. It was all shrunk to about four hours. That’s a time savings, and it’s huge.”

After completing the demo, the technician bought the SL1000 unit. Since then, the company invested in three more SL1000 units. Two will go to other technicians, and another will remain in its lab to help streamline lab analysis. “I’ve been using Hach technology in my labs since I started in this business. It’s all streamlined. All in one place. One instrument does so many different things.”



Hach SL1000 and Chemkey reagents

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