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A Brief Introduction to the WESTCO SmartChem Automated Discrete Analyzer

The SmartChem is a radical departure from continuous flow analyzers using the technology of segmented flow analysis or flow injection analysis. Historically, the Direct Read technology employed by the SmartChem is not radical in the sense that it is most analogous to a human technician using a manual spectrophotometer.

The SmartChem's robotic arm pipettes volumes as low as 1 μ L +/- 1% by volume, which is much more precise than any pump tube. It aspirates microliters of sample and reagent, mixes them in a discrete cuvette, waits for the sample to reach full color development, and takes a reading directly in the cuvette (hence the term Direct Read) at the appropriate wavelength. Afterwards, it washes and rinses the cuvette, then performs a quality test on it to ensure that it is clean. Any "bad" cuvette is flagged for the operator to replace at an appropriate time. Using 120 semi-disposable cuvettes, the SmartChem can process samples at rates of up to 200 samples per hour, even with 15 "bad" cuvettes (a full set of cuvettes typically lasts at least three months).

A big advantage over continuous flow analyzers is the fact that you don't need to maintain a complex hydraulic system. With the SmartChem, there's no flow cell or flow-through cuvette, no baseline or bubble pattern establishment, no manifold changeover, and no manifolds or valves to clog. Simply add reagents and sample, and the SmartChem starts the run. Method changeover simply involves the SmartChem pipetting the appropriate reagents and sample, and using the proper interference filter. And the lack of a complex hydraulic pumping system makes daily operation, troubleshooting, and training much, much easier.

All of which means that more time is spent actually processing samples, and less time fixing and maintaining the analyzer itself.