Batch Chemical Process Optimization
Identify opportunities for batch process improvement

Typical issues facing batch processes
- Long batch cycle times
- Process bottlenecks limiting production
- Reactor problems resulting in low yields
- Poor product quality
- Poor control performance causing long periods of off spec production

The Batch Process Optimization diagnostic service assesses the current performance of a batch process area to establish a “fingerprint”, a unique performance benchmark. This includes a statistical analysis of process instrumentation data and laboratory data to provide an assessment of batch cycle times as well as cycle times for individual steps and phases. It also includes an evaluation of instrumentation and control loop performance. A resulting report provides improvement recommendations.

Benefits
Facilitates management decision process by focusing on high value opportunities for improvement
Reduce variability between batches
Increase yield, reduce waste / off spec production
Reduce batch cycle time to increase productivity
Reduce total operating costs.
Clear path to quickly close the performance gaps by using the proposed improvement plan

Features
- Access to ABB optimization experts
- Batch Performance Benchmarking
- Detailed improvement plan
- The ABB Batch Process Fingerprint identifies and documents opportunities for batch process improvements. Batch cycle times, step and phase cycle times, and instrumentation and control loop performance are used to define benchmarks for batch performance.

Plants with batch operations can benefit from this platform-independent, non-invasive service. The service includes an improvement plan with site-specific improvement opportunities, prioritized by estimated economic benefit.

Performance Indicators
Comprehensive testing and analysis will measure Key Performance Indicators, used to assess batch performance and improvement area potential:
- Batch Cycle Times
- Step and Phase Cycle Times
- Instrumentation and Control Loop Performance

Process Analysis
Each performance indicator includes indices derived from historical batch data collected over a specific time period. The indices are used to evaluate the performance level of various aspects of the batch process, including but not limited to:
- Level 1 controls
  - Flow, pressure, level, and temperature controllers at different production rates
- Level 2 supervisory controls
- Composition and temperature profiles, satisfaction of product specifications
- Critical product specification limits
- Operating constraints
- Batch control configurations

Identifying the process area(s) that are under-performing is the first objective in the diagnostic procedure. The robustness of the diagnostic has a significant impact on the efficiency and consistency with which the improvements can be achieved. In order to provide practical solutions for problems often identified in a batch process, ABB has developed well-defined, logical optimization procedures.

The process and lab data is analyzed to provide the resulting Key Performance Indicators. Data from multiple batches can be trended together and KPIs compared. The trends allow for fast visualization of batch data with the ability to zoom in on periods of interest.

The batch data analysis helps to identify bottlenecks that limit cycle times. Recommendations help to increase uptime, reduce response times to upsets, and increase throughput. The results also help to reduce the time needed to investigate quality and equipment issues.

Reporting
A report is provided to disclose the findings and recommendations of the process performance diagnosis. This includes an actionable improvement plan.

Improvement Plan
The improvement plan defines how to resolve the performance bottlenecks and how to move toward optimal performance. In addition, the associated financial impact for each recommendation is provided.

Based upon the findings, recommendations may include but are not limited to tuning PID controls, adjusting supervisory controls, adding optimizing controls, modifying base control logic, editing recipes and updating batch procedures for operations.

Additional ABB Process Optimization Services
The Batch Process Fingerprint Service is the first step in achieving and sustaining higher performance levels. ABB offers Performance Improvement Services and Performance Monitoring Services to complete the continuous improvement cycle.

Performance Improvement Service
ABB offers this service to implement the improvement plan outlined in the Batch Process Fingerprint report. An ABB Engineer, experienced in batch process controls and process improvement, is assigned to lead the improvement activities.

Other ABB Services
- Advanced Process Control
- Alarm Management Fingerprint
- Industrial Boiler Fingerprint
- DCS Diagnostic Fingerprints
- Cyber Security Fingerprint