# Pulp Dryer Fingerprint
## Identify opportunities for machine performance improvement

Machine benchmarking establishes current process and control performance levels and provides basis for evaluating and identifying improvement opportunities. The resulting diagnostic report provides improvement recommendations and associated estimated ROI.

**Typical savings potential: $100,000 – $250,000**

### Benefits
– Facilitates management decision process by focusing on high impact opportunities for improvement
– Provides clear path to quickly close the performance gaps by using the proposed improvement plan
– Provides a solid foundation for continuous improvement based on data

### Features
– Access to ABB optimization experts
– Process performance benchmarking
– Detailed ROI-based improvement plan
– Clear communications during data collection and diagnosis activities

### Pulp Dryer Fingerprint
The ABB Pulp Dryer Fingerprint is a process performance diagnostic service for pulp dryer optimization. It is a platform-independent, non-invasive service that can be applied to any pulp dryer. The diagnostic fingerprint includes an engineered troubleshooting methodology to identify barriers to optimized performance and improved profitability. It generates both a performance benchmark and an improvement plan, consisting of a set of improvement opportunities, which are prioritized based on estimated economic benefits.

### Performance Indicators
The fingerprint involves comprehensive testing and analysis designed to measure four key performance indicators. These performance Indicators are used to assess machine performance and improvement area potential (see Figure 1).
– Product Variability
– Machine Response
– Stock Approach Stability
– Profile Capability

Historical data is used to validate test results.

### Machine Area Testing
Each performance indicator includes a series of indexes derived from specific machine tests. Each test is performed inside product specifications, utilizing ABB's diagnostic tools and methodologies. The resulting index is used to evaluate the performance level of different areas of the pulp drying process including:
– Mechanical vibration and rotational frequencies
– Machine and cross direction controls
– Lab testing procedures
– Sheet break recovery
– Process control system performance
– Coordinated speed control
– Dryer management control

Identifying machine area under-performance is the first step in the improvement process. Understanding the problem and having the expertise to provide solutions is assured through ABB's extensive experience in pulp dryer control.

In order to provide practical solutions for problems identified in the pulp drying process, ABB has developed defined, logical optimization steps for each machine area. The numerical result or index of each test points to the machine area problem and also points to the bottleneck location in the optimization sequence.

Once the entry point has been established for each machine area, the solution to the performance bottleneck and the remaining steps to optimize the process become clear.

For example, the Machine Response indicator is used to determine a performance index for the machine direction controls (see Figure 2). The test entry point is defined by the specific machine tests and data analysis associated with this performance indicator.
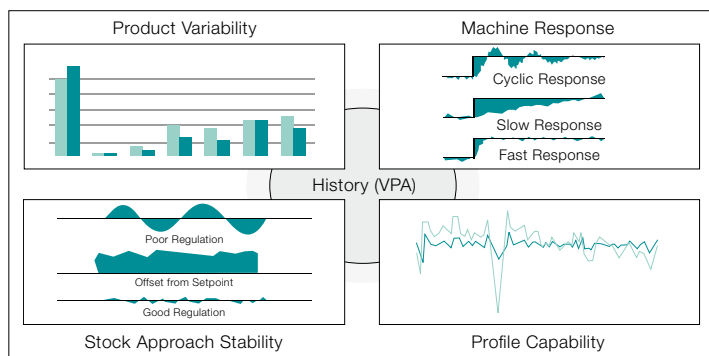
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Figure 1 | Performance Indicators



Figure 2 | Machine Areas: Implementation Modules

The Machine Response indicator includes multi-level testing and analysis applied to Dry Stock, Weight, Moisture, and Rush/Drag. Similar testing methodologies are involved with each performance indicator.

Complete Machine Area testing sequences require three to five working days to collect the data required to complete the diagnosis and develop improvement recommendations.

## Reporting

An Executive Report and a Technical Report are provided to disclose the findings and recommendations of the process performance diagnosis.

- **Technical Report** provides supporting data collected during the machine diagnosis.
- **Executive Report** provides benchmark results, summary of findings, financial impact of recommendations, and an actionable improvement plan, based on the machine diagnosis.

## Improvement Plan

The improvement plan defines how to resolve the performance bottleneck and improve performance. In addition, the associated financial impact for each recommendation is provided.

Based upon the findings, recommendations may include valve replacement, isolating high frequency machine problems related to: rolls, pumps, screens, machine clothing, cleaning up signal conditioning problems, optimizing or adding control logic, updating standard operating procedures, or re-tuning controls for optimal performance.

The Pulp Dryer Fingerprint is the first step in achieving and sustaining higher performance levels. Annual Fingerprint, Implementation, and Sustaining services are recommended as part of your service contract agreement to achieve and continue the improvement process. These can be scheduled within a single- or multi-year service contract agreement.

ABB is the world leader in pulp and paper applications. In depth knowledge and experience in this area allows comprehensive evaluation, diagnosis, remedial recommendations and implementation, and the ability to manage and sustain process performance improvement.
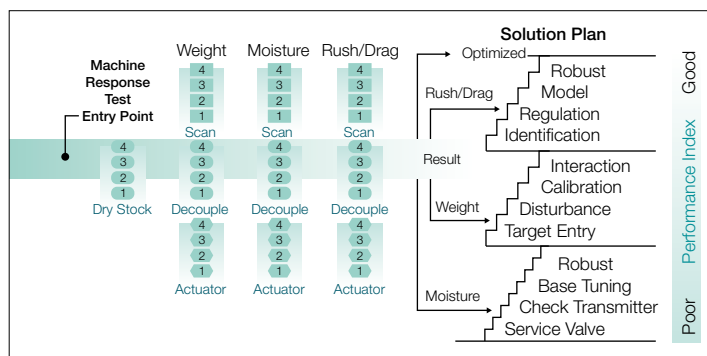
### Delivery Schedule

**Day 1**

- Project introduction meeting
- Setup data collection software and hardware
- Begin collecting QCS data for the Product Variability and Stock Approach Stability tests

**Day 2**

- Complete the single point collections for the Product Variability test
- Perform step testing on Weight and Moisture for the Machine Response test

**Day 3**

- Complete Machine Response testing with Headbox Step tests

**Day 4**

- Collect steady-state profiles
- Perform cross-direction bumps to complete Profile Capability testing

**Day 4-5**

- Perform initial data analysis for Summary of Findings exit meeting
- Conduct Exit Meeting

**Day 6-8 (off site)**

- Complete final data analysis and generate executive and technical reports

**Communication with the mill precedes scheduled activities to ensure coordination with ongoing mill activities. A daily activity list includes items completed during the day, a summary of findings, and a plan for the following day.**

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