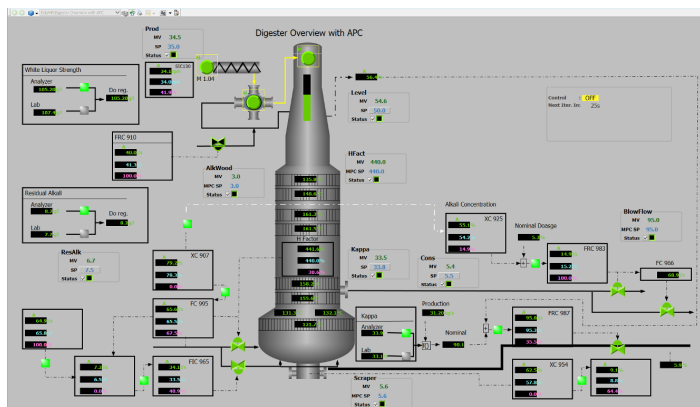


PULP AND PAPER

## OPT800 Cook/C

# ABB Ability™ Advanced Process Control for continuous digesters



OPT800 Cook/C overview display

When paired with the Kappa Virtual Measurement, which provides calculated Kappa values in the cooking zone, mills gain more frequent insight into kappa values to make corrections quicker for tighter control.

### Improving continuous digester cooking conditions

Producing consistent quality pulp at high production rates is a challenging task for digester operators, particularly in the presence of chip size and moisture variations induced by seasonal changes, geographical factors and the wood source. Moreover, the scheduled swings from hardwood to softwood make the process control task even more complex. OPT800 Cook/C is an ABB Ability™ Advanced Process Control (APC) solution that controls and monitors continuous digesters. At the core, OPT800 Cook/C stabilizes pulp production, reduces raw material and chemical usage and coordinates the numerous loops to achieve optimum on-specification pulp quality at minimum variance. For bleached grades, this APC solution also helps minimize bleaching chemical usage.

### Features

- Digester level, kappa, residual alkali and blow consistency controls for continuous digesters
- Pulp tracking correlates process and operating parameters, from chips to final cooked pulp
- Real-time adaptive modelling: Automatic adjustments based on process changes
- Higher-order model support: Captures process dynamics accurately
- Cost optimizer: Looks for ways to optimize operational costs within process constraints

Reduce kappa variability and achieve optimum pulp quality with OPT800 Cook/C, an ABB Ability™ Advanced Process Control solution for controlling and monitoring continuous digesters. By stabilizing the chip column movement, the solution creates a similar cooking history for all chips to decrease pulp quality variations and raw material consumption.

- Pulp quality profile throughout digester zones
- Reporting function automatically calculates KPIs and presents them in day/shift reports
- Performance monitoring with on-site and remote access for customer and ABB
- Kappa Virtual Measurement with auto-correlating calculations

### Benefits

- Increased production (1-5%)
- Reduced kappa variation (25-50%)
- Lower alkali consumption (2-5%)
- Increased unbleached pulp yield
- Lower consumption of energy and bleaching chemicals
- Smoother production, grade and/or chip species changes
- Decreased variation in residual alkali

### How it works

OPT800 Cook/C stabilizes the chip column movement to create a similar cooking history for all chips by ensuring consistent dwelling time within different zones of the digester. The accurate control of cooking time, alkali dosage and cooking temperature decreases pulp quality variations, and alkali and steam consumption, while improving pulp yield. OPT800 Cook/C is applied as a fully integrated APC solution within 800xA. Once the process is automated and stabilized, chemical and steam usage use can be further optimized using automatic target management to find the best economical process constraints - without compromising quality. Available as a service through the ABB Collaborative Operations delivery model, pulp mills can choose to never lose sight of APC performance with always-on monitoring and analysis.

## Real-time adaptive modelling

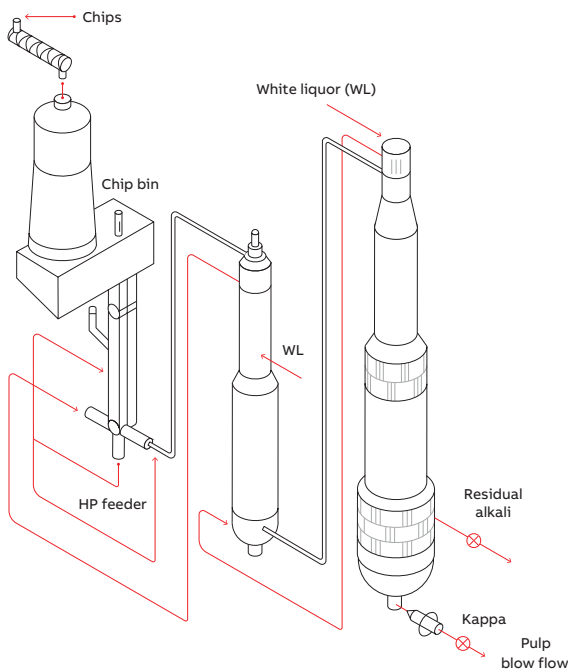
Dynamic model adjustment and adaptation in real time is a unique feature to ABB's APC platform. It means process models (covering the digester, oxygen, bleaching, washing, causticizing and lime operations) are dynamically updated if the process conditions change for things like grade changes, production rate changes, high inlet Kappa, etc. If any important process condition or property changes, the models can be updated automatically, keeping production and quality smooth and consistent.

## Pulp tracking function

The pulp tracking function accepts various process measurements upstream of the cooking process and tracks them through the various sections of the digester up to the blow line. The tracked process variables are used to develop non-linear empirical models of various quality variables such as kappa and blow consistency. Having a pulp quality profile across the digester provides insights during swings in pulp quality and improves the process diagnostic capabilities.

## Kappa Virtual Measurement

Tighter control is achieved with the inclusion of a Kappa Virtual Measurement that helps overcome the bottleneck of infrequent physical measurements by providing visibility into pulp quality across the cooking plant. Also known as a soft sensor, the Kappa Virtual Measurement utilizes mill-specific data inputs and machine learning technologies to generate continuously optimized calculations that predict a Kappa measurement in the upper cook zone of the digester.

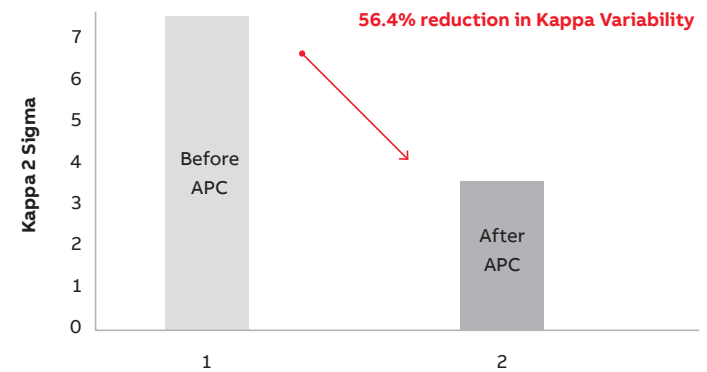


OPT800 Cook/C - Continuous cooking process overview

Ongoing performance monitoring and optimization tasks maintain and improve the calculation by compensating for any operational changes. The virtual measurement provides more frequent inputs to make any necessary corrections as soon as variation is detected. Plus the impact of making a correction, such as manipulating the H-factor, is immediately visible by how it affects the prediction.

## Operator displays and reports

Highly-intuitive, task-oriented and easy-to-access operator displays are provided to monitor real-time, historical and prediction trends data as well as modify tuning parameters. OPT800 Cook/C allows customization of the user interface to meet a wide range of project needs. The reports module calculates the key performance indicators such as alkali usage, controls utilization, and steam consumption, and presents them in the day/shift report. OPT800 Cook/C is delivered as a subscription-based service and consists of the state-of-the-art APC installation, start-up, and training, as well as tuning and monitoring services.



OPT800 Cook/C helped an European kraft pulp mill reduce Kappa variability by 56.40% and sustain it over 9 years.

