

PAPER TECHNOLOGY INTERNATIONAL

THE JOURNAL OF THE BIOFOREST PRODUCTS SECTOR



PITA PAPER *matters!* 2018 Conference & Exhibition at Lancaster University

Smart Technologies: Chemistry Connected

Simon Rogers (Buckman)

PAPERmatters 2018!

The
Presentations

Simon Rogers Buckman Laboratories **Buckman**

Simon started in the Paper Industry in the Technical dept. of Whatman paper in 1990. Simon joined a supplier to the paper industry in 1995 and have been in technical sales role since then.

He has been with Buckman for 15 years and his current role is Technology Manager for Packaging – Europe



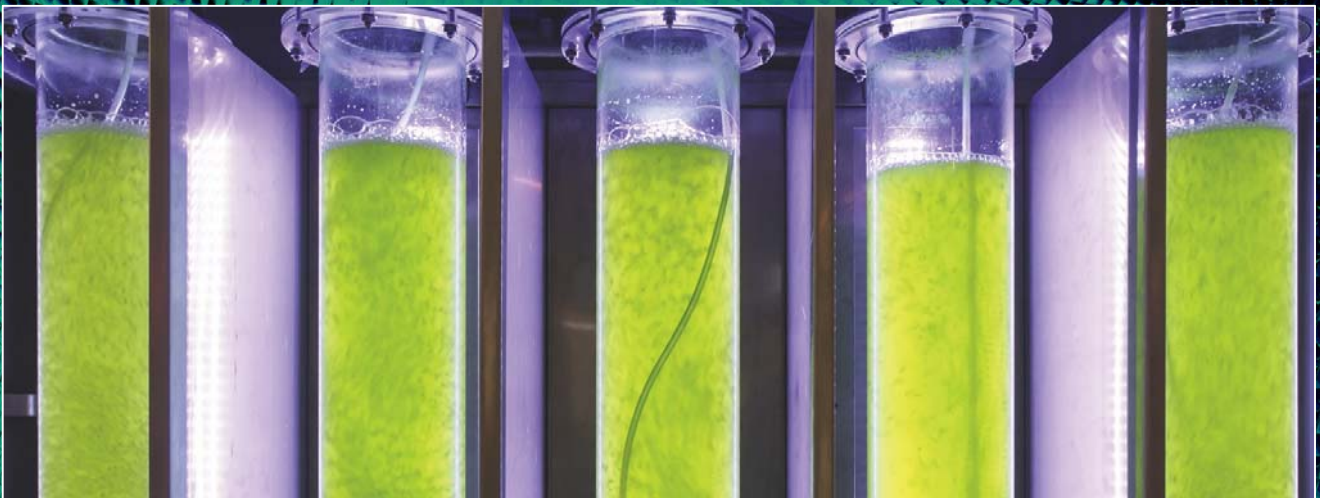
The author may be contacted via the **PITA Office**
Telephone: 0300 3020 150 or **E-mail:** info@pita.co.uk



The industry is evolving.

Adapt. Or die.

From the science of products...



To the art of the possible.



We are not just chemistry.

We are Chemistry, connected.

Industry
needs

Smart
technology

Innovation

Best
practices

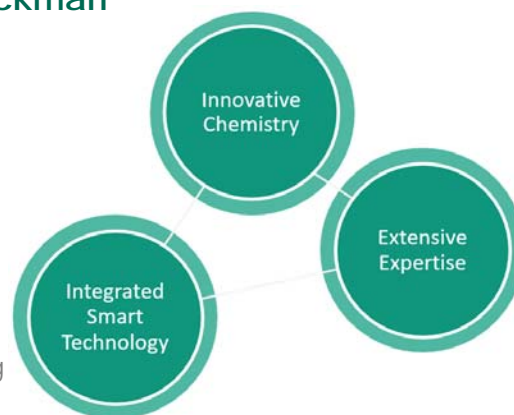
Customer
Service

Our Value Proposition ...

Pursuing the **art of the possible**

Smart Technologies available (now) from Buckman

- **Recovery Boiler Advisor (RBA)**
 - Software based leak detection system
- **ECHOWISE™**
 - Online monitoring & control of entrained air
- **Online Natural Coating (ONC)**
 - Coating innovation for the tissue industry
- **MARISSA**
 - Maximize product selection for chemical refining
- **Buckman OnSite®**
 - Web based customer portal and dashboard



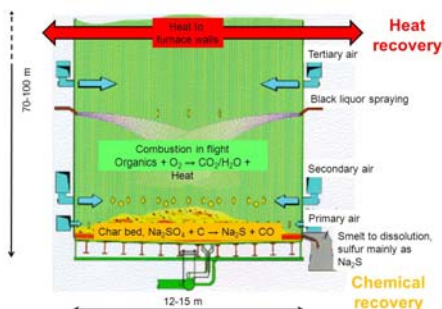
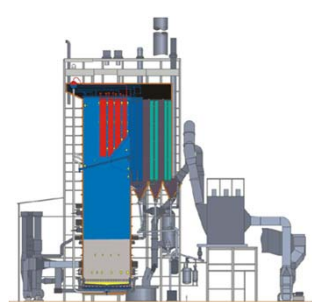
Recovery Boiler Advisor (RBA)

Software based leak detection system

A Comprehensive Solutions Provider ...

Recovery Boiler Advisor

'Originally' Developed for Kraft Recovery Boilers - higher risk to people & assets



Explosions caused by
Smelt – Water contact
in lower furnace

The technology is equally applicable (and adapted) to other fuel types including biomass boilers for leak detection and efficient maintenance

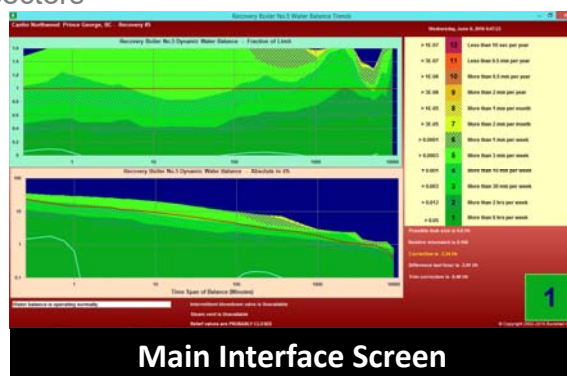
24 October 2018

10

A Comprehensive Solution Provider ...

Recovery Boiler Advisor

- Software based - Leak detection System
 - Leak identification / characterization in all boiler sectors
- Based on Water balance analysis
 - Sensitivity 0.2-0.5% on boiler feed water
- No specific sensors required
- No chemicals or tracer required
- Dynamic Model to compensate for shrink and swell
 - caused by load and pressure changes
- On line technical support by remote access
- Implementation - very simple (+/- 15 minutes)
- Operated from a standard PC computer



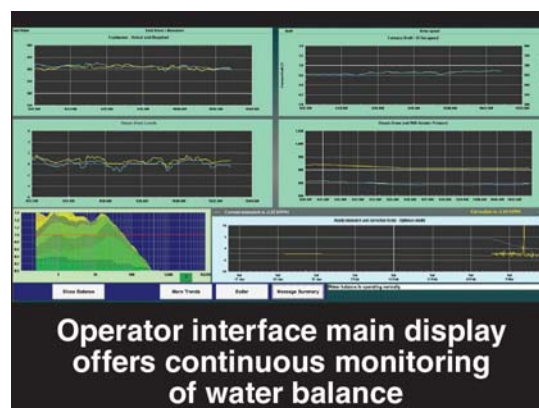
24 October 2018

11

A Comprehensive Solution Provider ...

Recovery Boiler Advisor

- Helps operators:
 - Decide on necessity of an emergency shutdown
 - Predict the presence of tube leaks
 - Evaluate situations where leakages are present
- RBA can:
 - Predict fouling trends in boiler
 - Provide intelligent boiler trip analysis
 - Warn of impending dry-out conditions
 - Maintains sensitivity during load changes



24 October 2018


12



ECHOWISE™

Online monitoring & control of entrained air

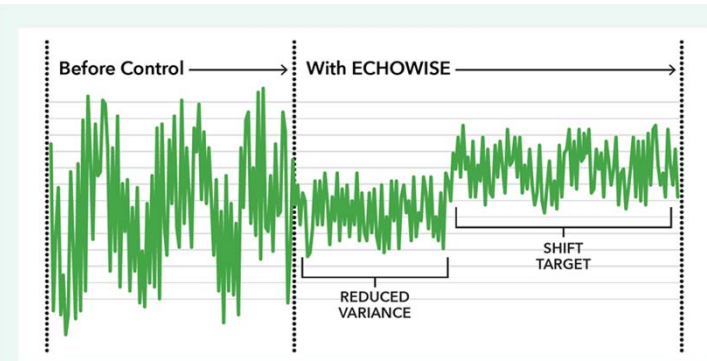
10/24/2018 13



ECHOWISE™ Technology

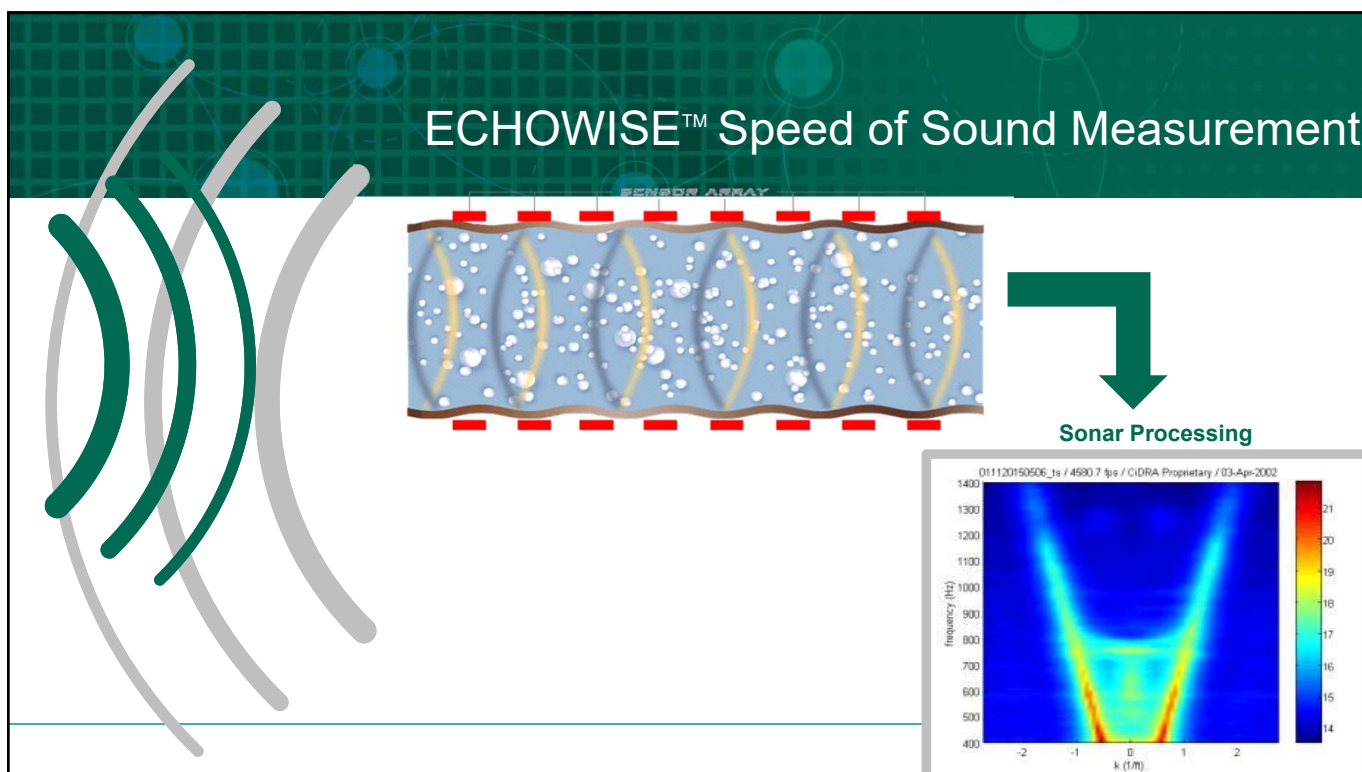
On-line monitoring and control of entrained air

Advanced process control with **ECHOWISE™** allows Buckman to partner with your process



Improved process performance as a result of combining chemistry with technology.



Buckman



The ECHOWISE™ Difference

What makes this technology different?

- Non-invasive & non-contact
- Safe, simple installation with *no required downtime*
- Real-time continuous measurement
- Highly reliable & accurate
 - Not maintenance intensive like other units
 - No sample lines to plug
 - No moving parts
 - No calibration needed
- Works in consistency up to 20%

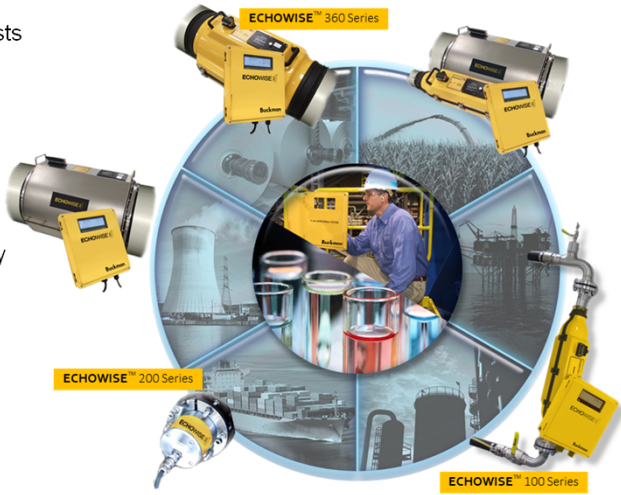



Buckman

Our Industrial Automation Suite ...

Buckman's ECHOWISE™ Ecosystem

- **Reduction** of operations costs
- **Enhanced** recovery
- **Variability** reduction
- **Reliability** improvements
- **Increased** process efficiency
- **Increased** production
- **Improved** product quality



Why is this different?

- Non-invasive
- Non-contact
- Safe installation
- No required downtime
- Real-time measures
- Highly reliable
- Extremely accurate
- Little maintenance
- No sample lines to plug
- No moving parts
- No calibration needed
- Works in consistency up to 20%

24 October 2018 17

An Integrated Pulp and Paper Solution

Buckman's ECHOWISE™ in Paper Machines ...

Range of Solutions


Paper Machine Solutions

- DefoamerV Deaerator Control
- Drainage Stabilization
- Control Other Drainage Drivers
- Tighten Basis Weight Control
- Tighten Strength Control

One ECHOWISE™ 360 Series For Drainage and Surface Foam Control

Example – Replacement of incumbent defoamer with our own product and EchoWise

The orange line is entrained gas measured in EchoWise, the blue line defoamer pump output.



24 October 2018 18

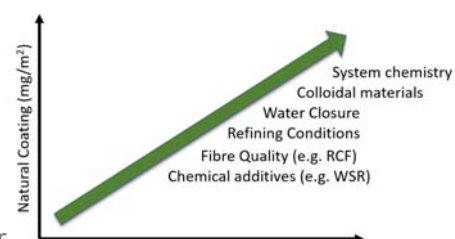
Online Natural Coating (ONC)

Coating innovation for the tissue industry

A Comprehensive Solution Provider ...

Online Natural Coating (ONC) Measurement

- Yankee coating matrix is the combination of;
 - Natural coating + Synthetic coating = Total Coating
- Natural coating is composed of;
 - The soluble and colloidal material coming from the wet end
 - Materials that remain on the Yankee dryer once the water and other volatiles have evaporated
- ONC is a critical part of the Yankee coating matrix impacting runnability, efficiency, and quality



Most creping parameters are focused on the dry end. But, 50% or more of the coating matrix is generated by the wet end.

A Comprehensive Solution Provider ...

Online Natural Coating (ONC) Measurement

- Manual NC measurements served as information in trouble shooting
 - Explanation of the source of an upset *after the fact*
- The gravimetric NC measurement doesn't allow for enough data points to capture all of the machine upsets
 - Reactive to poor creping efficiency / runnability / sheet quality
- What is required is?
 - Real time ONC quantitative data
 - Provide the operators with the information to enable them to proactively mitigate an upset condition
 - Ideally automate the coating application to adapt



24 October 2018

21

A Comprehensive Solution Provider ...

Online Natural Coating (ONC) Measurement

- Actively measuring ONC data:
 - Identifies how fiber quality or type affect your Yankee coating
 - Tracks impact of refining on natural coating levels (**fig 1**)
 - Predict the impact of any wet end chemical additions e.g. wet / dry strength resins (**fig2**)



Fig.1 Excessive refining

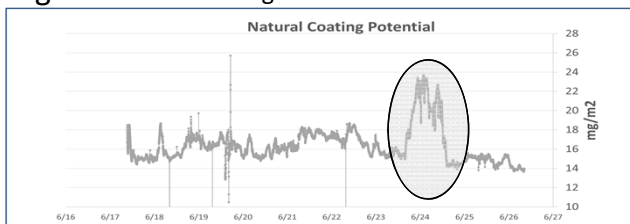
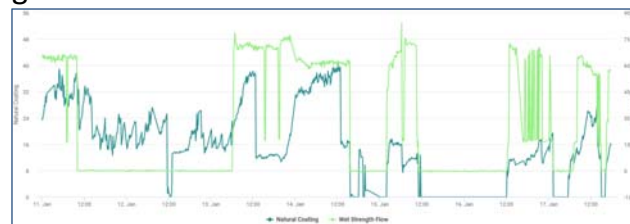


Fig.2 WSR versus ONC



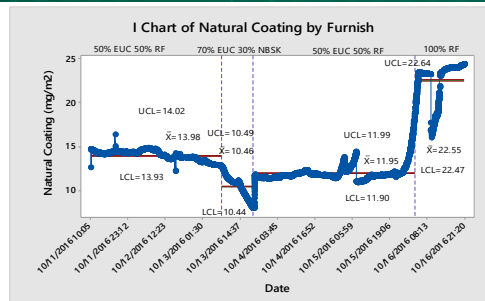
24 October 2018

22

A Comprehensive Solution Provider ...

Online Natural Coating (ONC) Measurement

- During this trial example, the ONC was accurately tracking the impact of furnish changes on the creping process
- Yankee coating was adjusted to compensate for the changes in natural coating which varied between 4 and 24 mg/m²
- Significant changes for a quality focused process.....
- Buckman OnSite® ONC** can provide natural coating data points every second
 - Allows reaction to the coating based on ONC measurements
 - Adjustment of synthetic coating (e.g. during an upset) allows the customer to maintain creping efficiency / runnability



24 October 2018

23

Marissa

Product selection for chemical refining

Knowledge + Innovation = Customized Value for Customers ...

Marissa: Technical Automation for Enzymes

- Buckman has significant expertise in enzymatic technologies
 - 2 Presidential Green Chemistry Awards: Maximize® and Optimize®
- Every enzyme product is different, potentially possessing multiple activities against multiple substrates
 - Impact on fiber properties
- We formulate with raw materials, generating our own distinct enzyme products
- We have combined our expertise in enzymatic “tints” with automation and digitization to allow us to generate the **right formulation for a specific furnish**

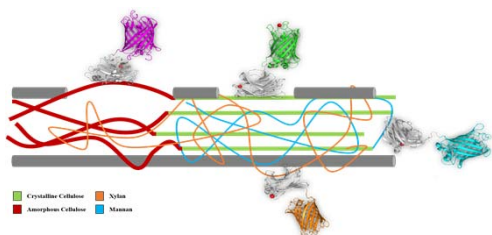


24 October 2018

25

Customization at the speed of the customer's process ...

Marissa - Automated Fluorescent Fiber Characterization



- **Fluorescent Fiber Surface Characterization (FFSC)** allows quantification of specific substrates on fiber
 - Uses fluorescent carbohydrate binding molecules to identify key activities for a given furnish
- **Buckman's robot, “Marissa”,** can rapidly analyze formulation activity and defibrillation potential
 - Ratio of fibrillation versus potential for over development
 - Formulation selected with respect to activity/benefit

24 October 2018

26

Knowledge + Innovation = Customized Value for Customers ...

Marissa: Technical Automation for Enzymes

- Simple yet powerful fibre surface characterization
 - Pulp process characterization
 - Refining impact
 - Predict physical properties
 - Measures impact of *Maximize* technologies (for fibre development)
 - Informs *Maximize* product selection
 - Rapid re-evaluation of existing *Maximize* program when process changes are made



24 October 2018

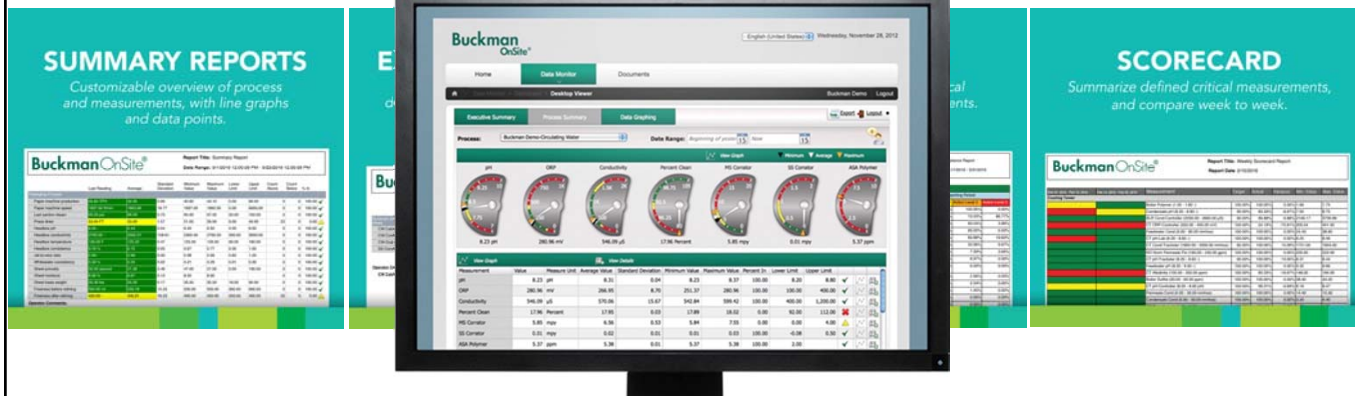
27

Buckman OnSite®

Process Data Exposed Empowering Decisions

Buckman OnSite®

- A web-based customer portal and data dashboard
- Gives mill personnel and their service reps access to vital information about operations



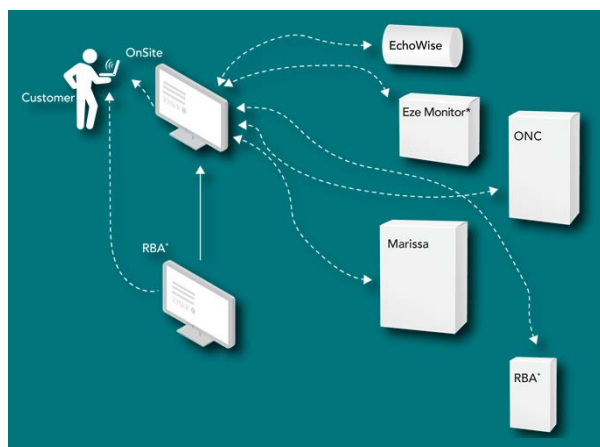
24 October 2018

29

Connecting Your Data and Our Solutions ...

The Buckman OnSite® Smart Network

- Our networked solutions
- Brings control to the customer
- System integration enables better process control
- Visible data drives insights
- Value increases over time
- Data security
- Big data possibilities



24 October 2018

30

