



Fine-tune your tissuemaking process.

With AckumenTM MCA-iTM, the monochloramine solution informed by artificial intelligence with actionable insights

As a tissue manufacturer, you know accurate dosing is critical to microbiological control. Too little oxidant can leave behind harmful microorganisms; too much can lead to residual toxicity in the product and corrosion of your equipment. Striking that balance is even more difficult—and potentially expensive—as you increasingly use recycled content of varying quality to make tissue. Those sources are even more vulnerable to microbial growth, which can lead to odor issues and spoilage, and ultimately customer dissatisfaction or culls. In addition to those challenges, you're expected to use less water without sacrificing tissue quality.

Ackumen MCA-i can help. This revolutionary chemical/digital system uses artificial intelligence with actionable insights. It monitors freshwater microbial quality, anticipates changes, and adjusts monochloramine dosage accordingly—even when the quality of your source fiber varies or you're using less water per ton of production. As a result, the right amount of MCA is dosed in all the right places across your process, from stock prep to machine. And that gives you the ability to control microbial growth with less guesswork and chemistry and more efficiency and flexibility.

A superior microbicide. The ultimate way to manage it.

Ackumen™ MCA-i™ combines our best-in class monochloramine chemistries with state-of-the-art sensing technology, cloud-based data analytics, 24/7 expert

monitoring and analysis, and accurate predictive modeling to take the work—and the guesswork—out of your microbiological program.

It's not about data. It's about actionable insights.

With conventional sensors and digital applications, you can get too much data and not enough meaningful insight. But what if you had clear visibility into your system and the ability to make decisions more easily?

MCA-i collects data and lots of it. Its state-of-the-art IoT hardware and software includes an advanced system of wireless sensors along with

cloud-based data you can trust. But it doesn't stop there. It takes system monitoring and management beyond the data dump to the insights you care about most and delivers them to you in simple, easy-to-read, actionable system visualization graphics, alarms, and notifications via the Ackumen Platform's remote process monitoring system.

What's an insight?

An insight is the detection of a pattern of anomalous behavior; the analysis of its root cause in measurable, rational terms; and a recommended course of action to resolve the issue. MCA-i gives you the power to see fouling patterns and corrosion, identify changes in product or water usage, detect process changes, and much more. Whether at your desktop or on your mobile device, you'll know in real time the status of your system. You'll clearly see how your KPIs are tracking. And you'll know at a glance whether an action is recommended now or in five days.



Optimize your operation with accurate dosing.

With MCA-i, you get sensor-controlled dosing that automatically adapts to changes in grade or source fiber quality. It feeds continuously at different rates, so you can avoid slug dosing and associated corrosion. It provides the correct amount of MCA to control microbial growth and reduces residual toxins. And because it feeds at

optimal dosing points, it diminishes the negative impact of oxidant on wet strength or Yankee coatings. Overall, you get a more flexible, cost-effective tissue-making process that delivers a high-quality product—even when you're operating on a reduced water supply.

Expert monitoring, benchmarking, and predictive modeling mean you don't have to go it alone.

MCA-i is backed by 24/7 monitoring and analysis performed by data scientists and engineers in our Insights Lab.

The Lab deals with events as they happen, assessing every alarm

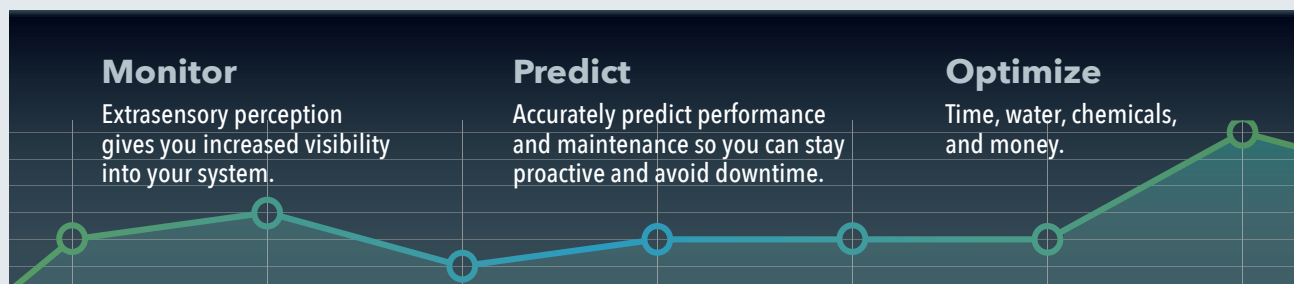


and eliminating false ones. Chemical engineers working closely with data science experts enable us to see around the bend and analyze patterns that are not visible to the naked eye.

Smart maintenance keeps MCA doing its job.

Rely on MCA-i to protect your budget with smart maintenance. Buckman owns and maintains all equipment, so you can get optimal oxidant control without capital expenses. In addition, MCA-i probes and sensors are equipped to indicate when they were made and put into service. This enables the Insights

Lab to track calibrations and overall health and create a service calendar for components to be cleaned, calibrated, or replaced. This greatly reduces the likelihood of unnecessary downtime due to equipment breakdown or extended maintenance.



Safety features eliminate worry.

The Ackumen™ MCA-i™ system comes with feed equipment designed for consistent, accurate delivery with a wide application range and flexible dosing options. Even more important, it offers industry-leading safety. All unit alarms come to your phone. And our unique feed equipment provides these advanced safety features:

- **Leak detection**
- **A built-in separator to keep neat chemicals apart in the case of a line break or other issue**

- **Automatic flushing of all application lines in case power is lost**
- **Regular inspection by Buckman personnel to maintain efficient, safe operation**

With MCA-i, the potential for human-chemical contact is greatly reduced. And Buckman's MCA chemistry is environmentally friendly, reducing the potential toxicity of your mill's effluent and producing far fewer potential carcinogens than other treatments. Chemical discharge to lakes and rivers can be significantly reduced.

See. Understand. Solve.

With Ackumen MCA-i, you can use the power of artificial intelligence with actionable insights to enhance your MCA performance. It helps you control biological issues before they become a costly problem—by dosing accurately and adapting easily to different fiber sources, process variations, and a reduced water supply.

It also provides full transparency into the performance and costs of your program. And in the end, Ackumen MCA-i helps you stabilize your tissue-making process so that you can consistently produce high-quality tissue that keeps customers happy and your budget in check.

Get the insights you need to manage MCA better.

Connect with your Buckman representative or visit buckman.com to learn more about Ackumen MCA-i.



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