

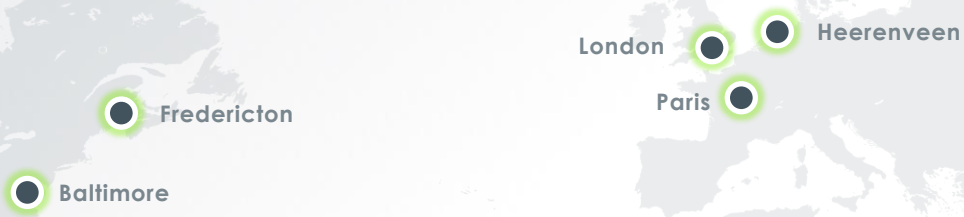
LUMINULTRA® ATP Techniques in Pulp & Paper Industry

Presented by:



Jean-Yves Soulard
Market Sales Leader – Speciality
Products





- **Founded in 1995: Head Quarters in Fredericton, Canada**
- **6 offices** around the world
- **Specialists in developing industrial microbial monitoring solutions**
- **ATP** for total microbial detection, **qPCR** for specific organisms, and **Genomic sequencing services (NGS)**



LuminUltra proudly serves some of the top companies in the world including:

Our Markets



Drinking Water



Oil & Gas



Industrial



Waste Water

Our references



Be Right™



RENAULT



kemira

synthomer



BUREAU VERITAS

kNAUF INSULATION

ARKEMA
INNOVATIVE CHEMISTRY



LUMINULTRA®

Committed to best-in-class microbial solutions

ATP Testing

Quick count of all microbes

qPCR Testing

Measure minute quantities of specific DNA or RNA

NGS Services

Identify and measure all microbes present

WHAT

Adenosine triphosphate (ATP) is an organic molecule that provides energy to living cells; it is detected using a luminometer to measure the combined quantity of all living cells in a sample.

Quantitative polymerase chain reaction (qPCR) is the gold standard molecular test to detect and quantify a specific microbe. It cycles temperature to duplicate and measure the target molecules.

Next-generation sequencing (NGS) is a molecular testing technology that maps specific sequences of DNA or RNA and can identify and quantify every specific type of microbe present.

WHY

- **Early indicator** of microbial attack on a system
- Allows for **preventative action** to avoid costly shutdowns
- Confirms treatment efficacy and enables biocide optimization to reduce direct and indirect costs

- Identifying the problem microbe enables the best solution
- Tests can be tailored for either **DNA or RNA** and applied to numerous applications
- Used when you know which microbe you're looking for

- Understand **exactly which microbes** are present in even a complex sample
- Track a microbial outbreak back to its source
- Used when you don't know which microbe you're looking for

HOW

- **BugCount® 2nd Generation ATP test**
- Handheld or fully automated inline systems
- Results in minutes

- **GeneCount® qPCR devices**
- Devices for lab or field use, or mail-in test service
- Results in ~2 hours (in-field) to 2 days (service)

- **GeneCount® Services** mail-in NGS testing
- Results in several days
- 100% services



BugCount®
PhotonMaster



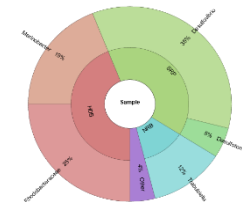
BugCount®
Guardian



GeneCount® Voyager



GeneCount® Basecamp



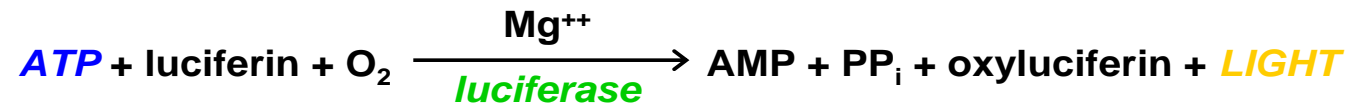
ROUTINE

SPECIFIC

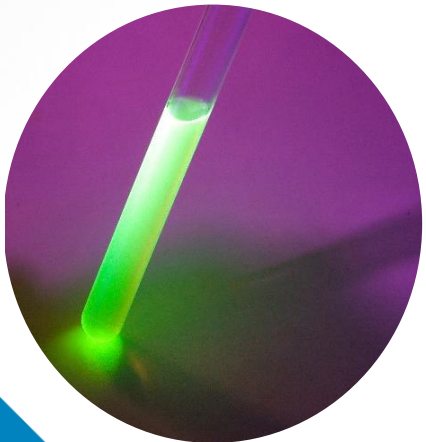
COMPREHENSIVE

What is A.T.P ?

- **Adenosine Triphosphate (ATP)**
 - Used in energy transfer in all living cells
 - Essential molecule for microbial life
 - Present in **all living organism** (bacteria-plant-animal...)
- **ATP-method**
 - based on the principle of **bioluminescence**
 - Determines the total amount of intracellular ATP in a sample



The amount of light produced is directly proportional to the microbiological population



Detect all microorganisms in minutes

- ATP - Adenosine Triphosphate – detects entire population of living cells within your samples (vs. culturable)
- Accurate and quantifiable picture of total microbial activity
- **5 minutes** to result from time of sample collection and can be performed in-field
- Interference-free testing possible for numerous sample types:
 - White Water
 - Process Water
 - Coating Colors
 - Waste Water Plant



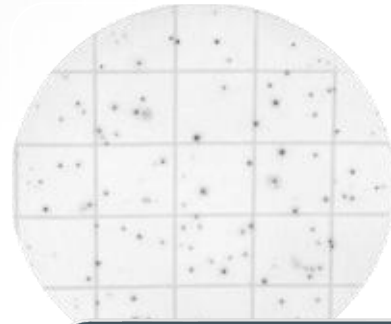
Historical Review

Developed for Industrial Use settings



Pour Plates <2000

- Cultured Method
- Limited to specific populations
- Labor Intensive
- Provided a defined result



Petri-Films <2009

- Industry Standard
- TBC/YM
- Not good for facultative or anaerobic environments



ATP ~ 2004

- MCA launch
- Industry shift to ATP
- Not always clear
- NOT developed for industrial use.



2nd Gen ATP ~2009

- Dev. For Industry
- More exact
- Interpretation still required



qPCR - 2023

- Field ready
- Provides a defined result
- Competitive Pricing
- Removes conflict around interpretation of ATP

'Developed for Industrial Use'

LuminUltra, 2nd Generation ATP

- **Larger Sample Volume**; more representative
- **Stronger Lysing Agent**
- ATP test kits for various industrial conditions
- **Removes Industrial Interferences**
- Delineates dead from alive bacteria
- **Calibration Standard: enzyme strength**
- **Results in picograms**
- Surface Swab Testing

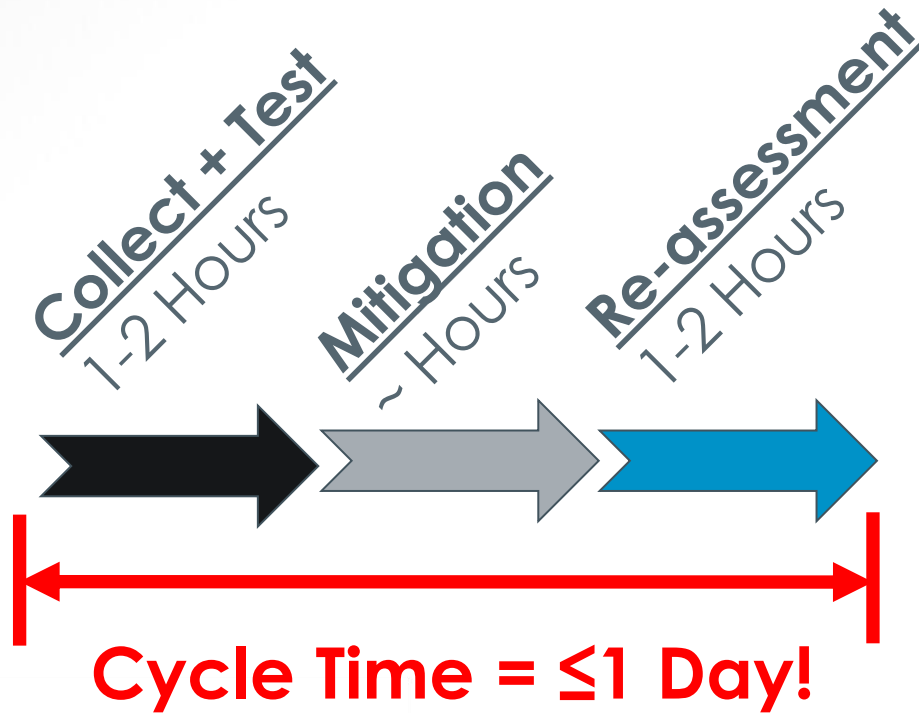
1st Generation Options

- Small or unmeasured sample size
- Weaker lysing agent
- 'One size fits all' scenario
- **No interference removal**
- Measures dead and live bacteria sample
- No calibration – only relative light units RLU (varies with enzyme strength, age, temperature exposure, storage conditions, cleanliness of meter)



How to implement 2nd Gen ATP testing

Conduct routine monitoring to quickly isolate location of highest microbial activity and get quick feedback



LuminUltra Industrial 2nd Generation ATP

LuminUltra provides microbial testing developed for industrial systems. Each area presents different challenges to capture the ATP of the sample. Viscosity, varied population types, interferences will impact first Gen. ATP. LuminUltra's proven sample preparation, lysing agents and enzymes meet the challenges of these varied microbiological environments.



WWTP

- Biological Wastewater Treatment
- Health of WWTP
- Activity of WWTP
- Cost Optimization



Paper Machine Process

- Immediate Results
- Repeatable and Trendable
- Easy to use



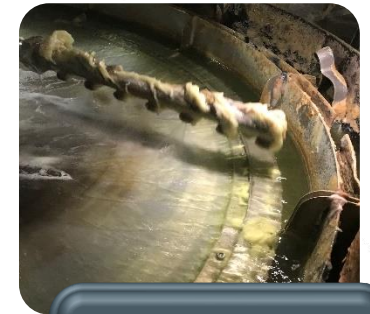
Paper Coatings

- Rail car condition prior to unloading
- Early detection of anaerobic growth
- Trend for developing needed clean out



Dyes/Polymer Wetend chemistry

- Costly Chemicals
- Preservation
- Trends for clean out of storage tanks



Fresh Water

- Filamentous
- Algae
- Unicellular organisms

The LuminUltra Solution

The four key components of LuminUltra offering:



- **PhotonMaster Luminometer** - used to measure light output from ATP tests.



- **6 core test kits** - specifically designed for various sample types.



- **Census** - used to interpret and analyze results.



Test Methods

QuenchGone
The Next Generation of Microbial Monitoring
AQUEOUS



QuenchGone21
Microbial Monitoring for the 21st Century
WASTEWATER



QuenchGone21
Microbial Monitoring for the 21st Century
INDUSTRIAL



QuenchGone21
Microbial Monitoring for the 21st Century
SPECIALTY



Deposit&Surface
The Next Generation of Microbial Monitoring
ANALYSIS



QuenchGone
The Next Generation of Microbial Monitoring
ORGANIC-M



Applicable Test Kit

Process Water & Fresh Water

- QGA – for filterable samples
- QG21i – for non-filterable

Coating Colors & Wet End chemistry

- QG21S – for non-filterable samples

Surfaces & Deposits

- DSA

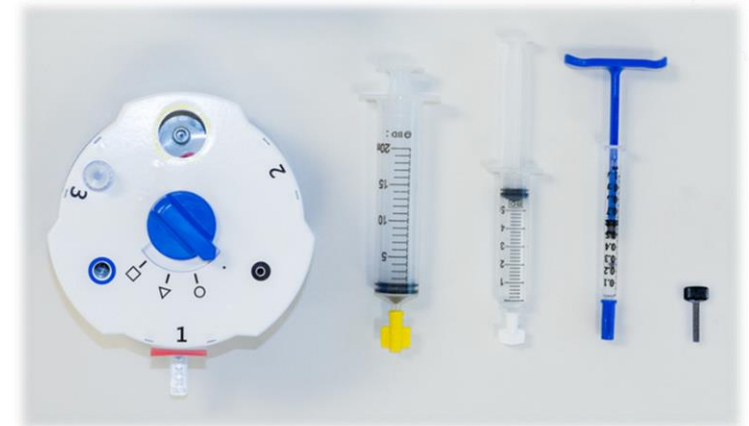
Waste Water Plant

- QG21W



Coming Soon: GeneCount™ Cube

- GeneCount® Cube rapid and precise solution for identifying and quantifying Legionella Pneumophila
- GeneCount® Cube simple-to-use qPCR testing protocol for on-site water
- Can be operated by anyone with minimal training and at any location where water quality is a concern
- Eliminates the need to ship samples and wait for lab results



Thank you.



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