

# Rapid on-site detection of lactic acid producing bacteria

## Proactive tools to protect quality in carefully crafted beverages



### NEW BEVERAGES – NEW CHALLENGES

#### Low alcohol beverages are susceptible to spoilage

Breweries and beverage producers are capitalizing on consumer demand for a variety of alcoholic and non-alcoholic product offerings, with new brands continuously entering the category. As a result, ensuring a consistently high-quality product is essential in this highly competitive market to win and retain customers. While high alcohol/hops in craft beer can deter spoilage organisms, other carefully crafted beverages with sometimes unconventional ingredients can be susceptible to a broad scope of microbes that produce damaging lactic acids. A major challenge for detecting beverage spoilers with traditional microbial testing is the lack of immediate, accurate and actionable results throughout the production process. These limitations make it difficult to address spoilage organisms in real-time and can result in facility contamination, production inefficiencies and holds, or shipping product at risk.

### A PROVEN PLATFORM

#### Improve quality processes and ensure brand integrity

brewLAP, powered by Veriflow, is a game-changing molecular platform with unparalleled accuracy and ease of use for rapid detection of microbes that can produce lactic acid and impact quality. The Veriflow platform utilizes DNA Signature Capturing Technology to detect and quantify *Pediococcus* and *Lactobacillus* species, with results in less than three hours of sample collection. brewLAP is the only lactic acid detection tool that enables actionable response to the threat of these damaging bacteria and prevent bottling or shipping at risk.

**“Bringing the brewPAL and brewLAP microbial detection system into our brewery is one of the best purchases we have made for our quality assurance testing program. The ability to detect lactic acid bacteria is very important to us in all of the beverages we produce, both alcoholic and non-alcoholic. Having data in a timely fashion allows for better decision making, resulting in improved quality, and less loss.”**

— Rebecca Brandenburg, Director of Quality,  
The Lion Brewery, Inc.

### THE SYSTEM

#### Simple and cost efficient deployment

The system is comprised of a small, customized thermocycler, pre-aliquoted PCR reagent tubes, and proprietary buffers. Results are obtained in less than 3 hours via hand-held disposable cassettes. brewLAP is ideally suited for both high volume and smaller craft beverage producers – with a modest capital investment and affordable per-test cost. Sample prep and use of the technology is simple and can be completed by brewery staff with minimal training.

Veriflow DNA Signature Capturing Technology	
DNA Amplification	Proprietary reagents eliminate need for sample purification
DNA Identification	Proprietary DNA signature detection specifically targeting beverage spoilers
Sample Preparation	No enrichment or purification steps required
Visualization of Results	Proprietary vertical flow mediated visualization of results for easy interpretation



### PRIMARY BENEFITS OF brewLAP

- Sample to results in under 3 hours
- Accurate, sensitive, and specific to *Pediococcus* and *Lactobacillus* species
- Simple and cost efficient deployment
- Quantitative and actionable results
- Reliable detection at all stages of beverage production

## CHOOSING THE BEST LACTIC-ACID DETECTION TOOL FOR YOUR APPLICATION

	<b>brewPAL</b> Hop-Resistant <i>Pediococcus</i> and <i>Lactobacillus</i>	<b>brewLAP</b> Lactic Acid-Producing Microbes
Target	<i>Pediococcus</i> and <i>Lactobacillus</i> - specific hop resistance genes horA and horC	<i>Pediococcus</i> and <i>Lactobacillus</i> species
Description	Accurate and sensitive to genes found on the extra chromosomal plasmids of <i>Lactobacillus/Pediococcus</i> species known to spoil beer	Accurate and sensitive to any lactic acid producing <i>Lactobacillus/Pediococcus</i> species that can proliferate in low levels or the absence of iso-alpha acids
Key Applications	<ul style="list-style-type: none"> <li>• Early detection of specific hops-resistant spoilage organisms</li> <li>• For example, alcoholic and non-alcoholic ciders and sodas</li> </ul>	<ul style="list-style-type: none"> <li>• Early detection when low or no concentration of iso-alpha acids are present in the beer</li> <li>• For example, alcoholic and non-alcohol ciders and sodas</li> </ul>
Matrix Compatibility	Beer, colony PCR, fermentation, yeast slurry, environmental, liquid culture	Beer, colony PCR, environmental, sucrose
Specification	<i>Pediococcus</i> and <i>Lactobacillus</i> -specific hops resistance genes horA and horC	<i>Pediococcus</i> and <i>Lactobacillus</i> species

### Test Protocol

#### DETECTION IS SIMPLE AND FAST

##### COLLECTION

Collect sample and centrifuge. Resuspend sample using provided proprietary Buffer A.

START - MINIMAL SAMPLE PREP



##### AMPLIFY

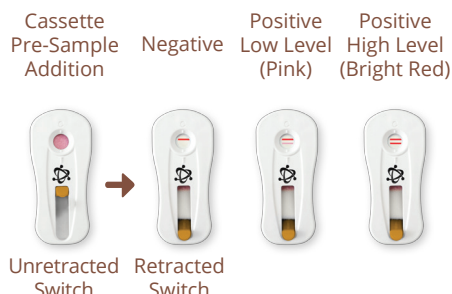
Transfer 5 ul of resuspended sample into provided PCR reagent tube. Place tube into Thermocycler and run program.

2.5 HOUR AMPLIFICATION



##### ANALYZE

Remove PCR Tube from Thermocycler and add proprietary Buffer B. Dispense PCR Tube contents onto test cassette window. Wait 3 minutes and retract test cassette switch to reveal test results. One line indicates negative result, two lines indicates semi-quantitative positive results.



### ADDITIONAL DETECTION TOOLS FOR YOUR BREWERY

Invisible Sentinel's portfolio of detection tools for breweries utilizes the same simple sampling, workflow, and equipment including the Veriflow Thermocycler. These tests are utilized throughout the brewing process, from post-boil to packaging as part of proactive quality management in the brewery.

**brewPAL**

Hop-Resistant *Pediococcus* and *Lactobacillus*

**brewDEK**

*Brettanomyces/Dekkera* species

**brewBRUX**

*Brettanomyces Bruxellensis*

**brewMAP**

*Megasphaera* and *Pectinatus*

**brewSTAT**

*Saccharomyces Diastaticus*

ITEM #	DESCRIPTION	SIZE
IS1042	brewLAP Complete Test System	1 Kit, 24 Tests
ISTC002	Veriflow Thermocycler	1 Unit

For more information or to place an order, please contact Invisible Sentinel at 215.966.6118 or [www.invisiblesentinel.com](http://www.invisiblesentinel.com)

Invisible Sentinel, a global molecular solutions company, is dedicated to providing first-in-class microbial detection tools. The company's core technology, Veriflow, is a patented, game-changing platform that integrates molecular diagnostics, antibody design, and immunoassays. Veriflow technology is AOAC International Certified for foodborne pathogen detection, and is used globally by food manufacturers, 3rd party testing labs, and premium wineries along with craft breweries.