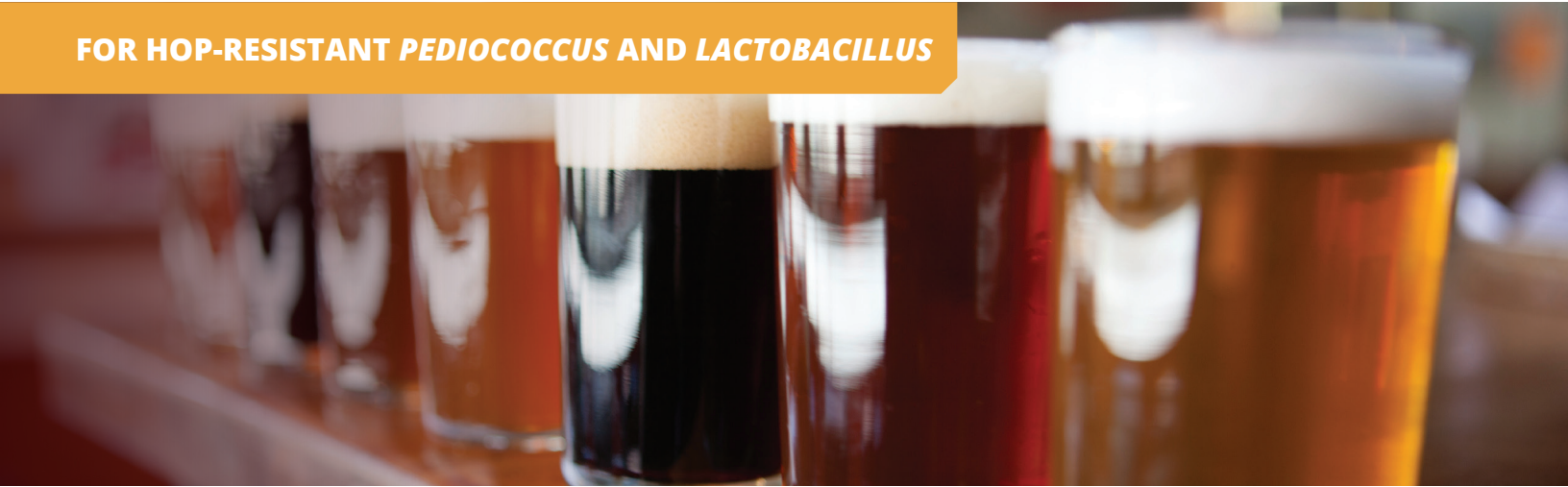


**FOR HOP-RESISTANT *PEDIOCOCCUS* AND *LACTOBACILLUS***



## Game-Changing Suite of Detection Tools

**Sample to Result in Under 3 Hours — Empowering a Proactive Approach to Quality at Your Brewery**

### THE CHALLENGE

**Lack of Detection Tools Combining Specificity, Speed and Accessibility**

You take every precaution to maintain the quality of your brews – and test as you go to ensure your standards are met. One major challenge is the lack of immediate, accurate and actionable test information throughout the brewing process. Traditional testing methods are dated, and limited by wait times and the inconclusive results of plating, or the expense and complexity of conventional molecular technologies.

### THE TECHNOLOGY

**Proven Platform Delivers Speed, Accuracy and Sensitivity**

Invisible Sentinel brew products are powered by Veriflow – a game-changing platform technology that combines proven diagnostic principles for microbial detection and innovative, first-in-class scientific approaches. Veriflow technology offers unparalleled performance with no compromise on ease-of-use or affordability.

### brewPAL FOR HOP-RESISTANT *PEDIOCOCCUS* AND *LACTOBACILLUS*

**Improve Quality Processes to Ensure the Integrity of your Brand**

brewPAL is the only *Pediococcus* and *Lactobacillus* detection tool with proven accuracy, unmatched ease of use and quantitative testing data available in less than 3 hours from sample collection – providing actionable results that enable you to optimize your quality processes.

- Prevents processing, bottling and shipping at risk
- Allows traceability to the point of contamination
- Reduces the risk of further contamination
- Protects against recall of tainted beer
- Protects your brewery's brand

#### Veriflow DNA Signature Capturing Technology

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



#### brewPAL Performance Specifications

Sensitivity (LOD)	10 cells/ml
Time to Results	< 3 hours
Matrix Compatibility	Beer, yeast slurry, colony PCR, environmental, liquid culture
Assay Configuration	Qualitative & quantitative
Target Selection	<i>Pediococcus</i> and <i>Lactobacillus</i> -specific hops resistance genes <i>horA</i> and <i>horC</i>
Specificity	<i>Pediococcus</i> species: <i>P. damnosus</i> , <i>P. inopinatus</i> , <i>P. parvulus</i> , <i>P. pentosaceus</i> , <i>P. acidilactici</i> , <i>P. clausenii</i> <i>Lactobacillus</i> species: <i>L. buchneri</i> , <i>L. brevis</i> , <i>L. rhamnosus</i> , <i>L. jensenii</i> , <i>L. backii</i> , <i>L. paracollinoides</i> , <i>L. lindneri</i> , <i>L. delbrueckii</i> , <i>L. fructivorans</i> , <i>L. acetotolerans</i> , <i>L. rossiae</i> , <i>L. plantarum</i>

“brewPAL is robust enough to detect *Pediococcus* and *Lactobacillus*, even in high biomass samples like yeast slurries that may be re-used for multiple generations and brews.”  
 – Mike Guilford, Production Manager  
 Russian River Brewing Company

“Earlier detection in the brewing process allows for effective remediation steps. brewPAL can pinpoint problematic bacteria even before high krausen of fermentation is reached.”  
 – Zachary Miller, Yeast and Fermentation Manager  
 Victory Brewing Company

“As a definitive quality assurance assay with the high sensitivity you need to ensure your beer is free of spoilage bacteria, brewPAL is peace of mind against a potential recall situation.”  
 – Chris Reilly, QA/QC Lab Manager  
 Weyerbacher Brewing Company

## ADDITIONAL TOOLS FOR YOUR BREWERY

**brewLAP**  
 Powered by Veriflow®  
 For Lactic Acid-Producing Microbes

**brewDEK**  
 Powered by Veriflow®  
 For *Brettanomyces*/*Dekkera* species

**brewBRUX**  
 Powered by Veriflow®  
 For *Brettanomyces Bruxellensis*

**brewMAP**  
 Powered by Veriflow®  
 For *Megasphaera* & *Pectinatus*

**brewSTAT**  
 Powered by Veriflow®  
 For *Saccharomyces Diastaticus*



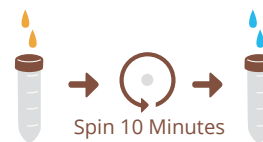
# Test Protocol

## DETECTION IS SIMPLE AND FAST

### COLLECTION

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

#### START - MINIMAL SAMPLE PREP



### AMPLIFY

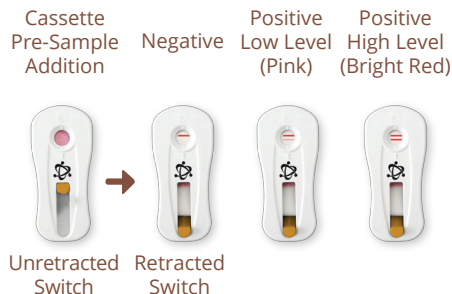
Transfer 5 ul of resuspended sample into provided PCR reagent tube. Place tube into Thermocycler and run program.

#### 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.



ITEM #	DESCRIPTION	SIZE
IS1020	brewPAL Complete Test System	1 Kit, 24 Tests
IS0904	Veriflow Loading Tray	1 Unit
ISTC002	Veriflow Thermocycler	1 Unit
ISRD001	Veriflow Reader	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 has been applied across multiple industries including food safety and beverage quality.

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