Game-Changing Suite of Detection Tools for the Brewing Industry

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. These limitations make it impossible to address spoilage organisms in real-time – and can result in facility contamination, production inefficiencies and holds, or shipping beer at risk.

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 combined with ease-of-use and is utilized for rapid detection of microbes in a wide variety of matrices and industries. The technology is AOAC International Certified for foodborne pathogen detection. The brew suite of products was developed specifically for the brewing industry and has been validated and implemented by a variety of award winning, quality-centric breweries around the world.

THE SYSTEM
Simple and Cost Efficient Deployment at the Brewery

The system is comprised of a small, customized thermocycler, pre- aliquoted PCR reagent tubes, and proprietary buffers. Semi-quantitative results are obtained in less than 4 hours via hand-held disposable cassettes, and quantitative results can be tracked, stored, and exported via the Veriflow Reader. The brew products are ideally suited for both high volume and craft brewers – with a modest capital investment and affordable per test cost. Sample collection and prep is simple, and can be completed by brewery staff with minimal training.

THE BENEFITS
Improve Quality Processes to Ensure the Integrity of Your Brand

Invisible Sentinel’s suite of detection tools for the brewing industry allowing brewers to protect beer quality by providing on-site detection of spoilage organisms at any stage of production and in any style of beer. The brew products allow detection of organisms such as Pediococcus, Lactobacillus, Wild Yeast, Megasphaera and Pectinatus from your finished product or proactively manage levels in select brews.

Transforming the way you protect quality at your brewery

- Sample to results in under 4 hours
- Accurate, sensitive and specific for the most detrimental beer spoilers
- Simple and cost effective deployment at your brewery
- Powered by Veriflow – proven DNA signature capturing technology
- Numerous products for multiple applications and styles of beer
- Allows timely product release and proactive monitoring of in-process beer and facility conditions

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 |

Product

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<th>Target</th>
<th>Benefits of Using the Product</th>
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<td>For Hop-Resistant Pediococcus and Lactobacillus</td>
<td>“brewPAL is robust enough to detect Pediococcus and Lactobacillus, even in high bio-mass samples like yeast slurries that may be re-used for multiple generations and brews.” Mike Guilford, Production Manager, Russian River Brewing Company</td>
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<td>For Lactic Acid-Producing Microbes</td>
<td>“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.</td>
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<td>For Brettanomyces/ Dekkera species</td>
<td>“We use Invisible Sentinel’s tests in our yeast management system as a critical process control point. Since we have wild and sour beers on site, along with multiple yeast strains, the speed of the assay allows us to quickly and efficiently monitor our production flow so we can detect any potential cross-contamination as early as possible.” Eli Kolodny, QA/QC Manager, Odell Brewing Company</td>
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<td>For Brettanomyces Bruxellensis</td>
<td>“We really enjoy how fast and accurate the brewBRUX test helps us determine the presence of Brettanomyces in our spirit barrel-aged brands and barrel-aged blends. It gives us confidence in our ability to manage wild yeast before blending and packaging these carefully-crafted brews.” Rick Blonkemeier, Director of Brewing Operations, Modern Times Beer</td>
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<td>For Megasphaera and Pectinatus</td>
<td>“Traditional micro methods for plating Megasphaera and Pectinatus can take days to weeks, which is impractical for both quality assurance purposes and the quality control of our beer. We have implemented brewMAP into our routine testing protocol in low alcohol/IBU brands alongside brewPAL to ensure our beer is free of these serious beer spoilers before it leaves the brewery.” Drew Russey, PhD, Laboratory Manager, Saint Arnold Brewing Company</td>
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<td>“Early and accurate detection of Saccharomyces diastaticus is integral to avoid unintended secondary fermentation, but more importantly for brand management and the end consumer’s safety. Differentiating this wild yeast from typical brewing yeast is a challenge with traditional methods, and PCR methods can help provide a sensitive and conclusive means for identifying an issue before it’s too late.” Christopher O’Connor, Director of Quality/Technical Brewing Sleeping Giant Brewing Company</td>
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For more information or to place an order, please contact Invisible Sentinel at 215.966.6118 or www.invisiblesentinel.com

Invisible Sentinel Products Integrate Easily Throughout the Brewing Process

**Test Protocol**

**DETECTION IS SIMPLE AND FAST**

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

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

**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
IS1028 | brewDEK Complete Test System | 1 Kit, 24 tests
IS1022 | brewBRUX Complete Test System | 1 Kit, 24 tests
IS1034 | brewMAP Complete Test System | 1 Kit, 24 tests
IS1042 | brewLAP Complete Test System | 1 Kit, 24 tests
IS1057 | brewSTAT Complete Test System | 1 Kit, 24 tests
IS0904 | Veriflow Loading Tray | 1 Unit
ISTC002 | Veriflow Thermocycler | 1 Unit
ISRD001 | Veriflow Reader | 1 Unit

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