

Preserve the Value Of Your Wine

Managing *Brettanomyces* Proactively
Through On-site Analysis at the Winery



Game-changing Detection Technology Brings Affordable, On-site PCR Testing to Your Winery

Veriflow DNA Signature Capturing Technology

DNA Amplification	Proprietary reagents eliminate need for sample purification
DNA Identification	Proprietary DNA signature detection specifically targeting <i>Brettanomyces</i>
Visualization of Results	Vertical flow mediated visualization of results for easy interpretation via hand-held cassette
Sample Preparation	No enrichment or purification steps required
Certification	AOAC International Certified for foodborne pathogen detection
Current utilization	Food and juice manufacturers, premium wineries, craft breweries; global 3rd party testing labs; U.S. and international

vinoBRETT Performance Specifications

Sensitivity (LOD)	10 cells/ml
Time to results	< 4 hours
Matrix compatibility	Juice, wine, lees, barrel rinsate, colony PCR, enrichment broth
Assay configuration	Qualitative and quantitative
Target selection	Ribosomal Deoxyribonucleic Acid (rDNA) gene
Specificity	<i>Brettanomyces bruxellensis</i>
	Active state and VBNC state (Viable But Non-Culturable)

vinoBRETT Validation

Validation Studies	Internal and external laboratory validation in collaboration with Jackson Family Wines and Enartis Vinquiry
Inclusivity	100%. Correctly identified 49 known isolates of <i>Brettanomyces bruxellensis</i> ¹
Exclusivity	100%. Correctly excluded multiple species of commonly occurring microorganisms found in wine

¹Strains sourced from University of California-Davis, Wine Microbe Collection, Department of Viticulture & Enology

Brettanomyces is inherent in winemaking, yet its presence may not be recognized until the effects of 4-EP/EG exceed desired sensory detection thresholds. Classic microbiological testing, including culturing, requires long wait times with inconclusive results. Current molecular technologies, such as RT-PCR, are too capital and labor-intensive to implement at the winery. All current methods have difficulty analyzing “young” wines during fermentation. Given these limitations, winemakers lack accurate, rapid detection to manage *Brettanomyces* proactively at the winery.

vinoBRETT is powered by Veriflow - a game-changing technology platform combining proven diagnostic principles with innovative, proprietary PCR technology. vinoBRETT was developed and validated for *Brettanomyces* management in partnership with Jackson Family Wines – it was developed for and in collaboration with winemakers.

The vinoBRETT system includes a customized thermocycler, pre-aliquoted reagent tubes, proprietary buffers, and hand-held cassette. The system quantifies viable *Brettanomyces* populations in less than 4 hours on the cassette, with only minutes of hands-on time to perform the test. The system requires minimal capital investment and affordable per-test cost, enabling proactive on-site *Brettanomyces* management.



ACTUAL SIZE SHOWN

Proactive Management Can Prevent Costly Remediation, and Preserve Quality and Value

Due to the power of Veriflow technology, vinoBRETT now makes it possible to conduct routine, proactive testing throughout the winemaking process to obtain accurate information about the presence and level of *Brettanomyces* at any time. Proactive quality management can mitigate the risk of producing wine that fails to meet your standards and results in lost value.

The technology is validated for use at all stages, with robust detection at low levels of infection. *Brettanomyces* management can begin as early as the fermentation stage; early detection of the presence of *Brettanomyces* allows you to proactively manage the situation long before the organism has the chance to impact wine quality or contaminate your tanks, barrels, hoses, and facility.

Detecting *Brettanomyces* early and at low levels enables **Management**:

- Less intrusive methods, including temperature modulation, higher SO₂, lower pH
- Minimal labor requirements
- Ability to isolate tainted lots early to minimize cross-contamination
- Minimal to no impact on wine quality and value

Economic Impact: Negligible (\$)

Detecting *Brettanomyces* late and at high levels requires **Remediation**:

- More intrusive methods, such as filtering, blending, additive treatments
- Labor-intensive processes such as sterilization, barrel access, barrel cleaning
- Increased costs and hassles in the event of cross-contamination
- Potential for bulking out or discarding wine

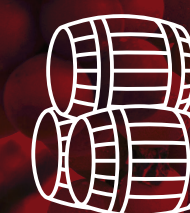
Economic Impact: Significant (\$\$\$)

Integrate vinoBRETT Throughout the Winemaking Process

Fermentation



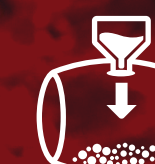
Racking



Topping Wines



Finishing



Bottling



“Early in-house Brett monitoring in wines during and just after fermentations, which was impossible to do before, allows us to effectively mitigate issues and avoid potential problems later in the process.”

– *Tod Mostero, Winemaker Dominus Estates*

“The test is easy to perform and interpret. Because we can now detect Brett sooner, our winemaker can take corrective actions before sensory impacts arise. We can isolate problem barrels or lots, and manage the impact of Brett. This tool enables us to do a better job of preserving quality.”

– *Doris Francis, PhD, Laboratory Supervisor J. Lohr Winery*

“Because we can now detect the presence of low levels of Brett before it synthesizes 4 ethyl phenol above the sensory threshold, we can manage the impact of Brett. The kit is easy to use, demands less technician time, and the start up cost is less than traditional PCR.”

– *Lynn Watanabe, Laboratory Director/Winemaker Oakville Winery and Napa Wine Company*

“This tool gives us a clear indisputable result and we can be proactive with that result. If we have issues with a particular barrel we can quarantine it to avoid cross contamination. It is absolutely cost-effective as well, and provides peace of mind about the quality of our wines.”

– *Hamish Clark, Senior Winemaker Saint Clair Family Estate, New Zealand*

Benefits of Implementing vinoBRETT

- Affordable, on-site analysis in less than 4 hours
- Accurate and sensitive across all stages from harvest to bottling
- Early detection minimizes costly downstream remediation
- Detects both active and VBNC *Brettanomyces* cells
- Sample prep is simple, with minimal training required
- Proactive *Brettanomyces* management preserves the value of wine

ADDITIONAL DETECTION TOOLS FOR YOUR WINERY

Veriflow Reader – Provides quantitative results and data management capabilities enabling winemakers to establish baseline data and trend analysis across vintages.



For *Pediococcus* and *Lactobacillus*

Accurate and sensitive to the species commonly found in wine

TEST PROTOCOL

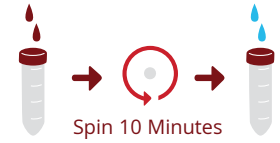
Results in 4 Hours with Less Than 10 Minutes Hands-on Time



COLLECT

Collect a homogenous sample and centrifuge. Resuspend sample into provided proprietary Buffer A.

START - MINIMAL SAMPLE PREP



DIGEST

Transfer resuspended sample into provided DIGEST reagent tube. Place tube into Thermocycler and run program.

50 MINUTE DIGEST



AMPLIFY (PCR)

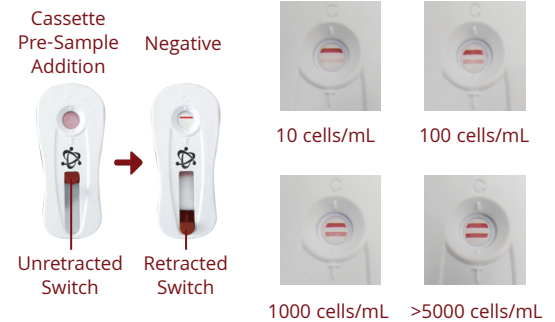
Transfer sample from DIGEST reagent tube into provided PCR reagent tube. Place tube into Thermocycler and run program.

2 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. Use Signal Quantification Card or Veriflow Reader for precise quantification.



ITEM #	DESCRIPTION	SIZE
IS1014	vinoBRETT Complete Test System Includes: Mastermix Reagents, Cassettes, Buffers	1 Kit 24 Tests
ISTC002	Veriflow Thermocycler	1 Unit
IS0904	Veriflow Loading Tray	1 Unit
ISR001	Veriflow Reader (Optional)	1 Unit

For more information or to place an order, please contact Invisible Sentinel at 215.966.6118 or 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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