



Gusmer
Enterprises, Inc.®

*Real-time Monitoring DO in Process using
Visiferm & Visitrace
Hamilton Series #2*

Agenda

- Gusmer & Hamilton Overview
- Hamilton Visiform mA and Visitrace mA
- Sample Points
- Inline vs. Spot Checks
- Sensor Housings
- Calibration
- ArcAir
- Q & A – Type questions in the Q/A box





Service with Knowledge® since 1924

Founded in 1918

Management and Ownership currently in 3rd generation

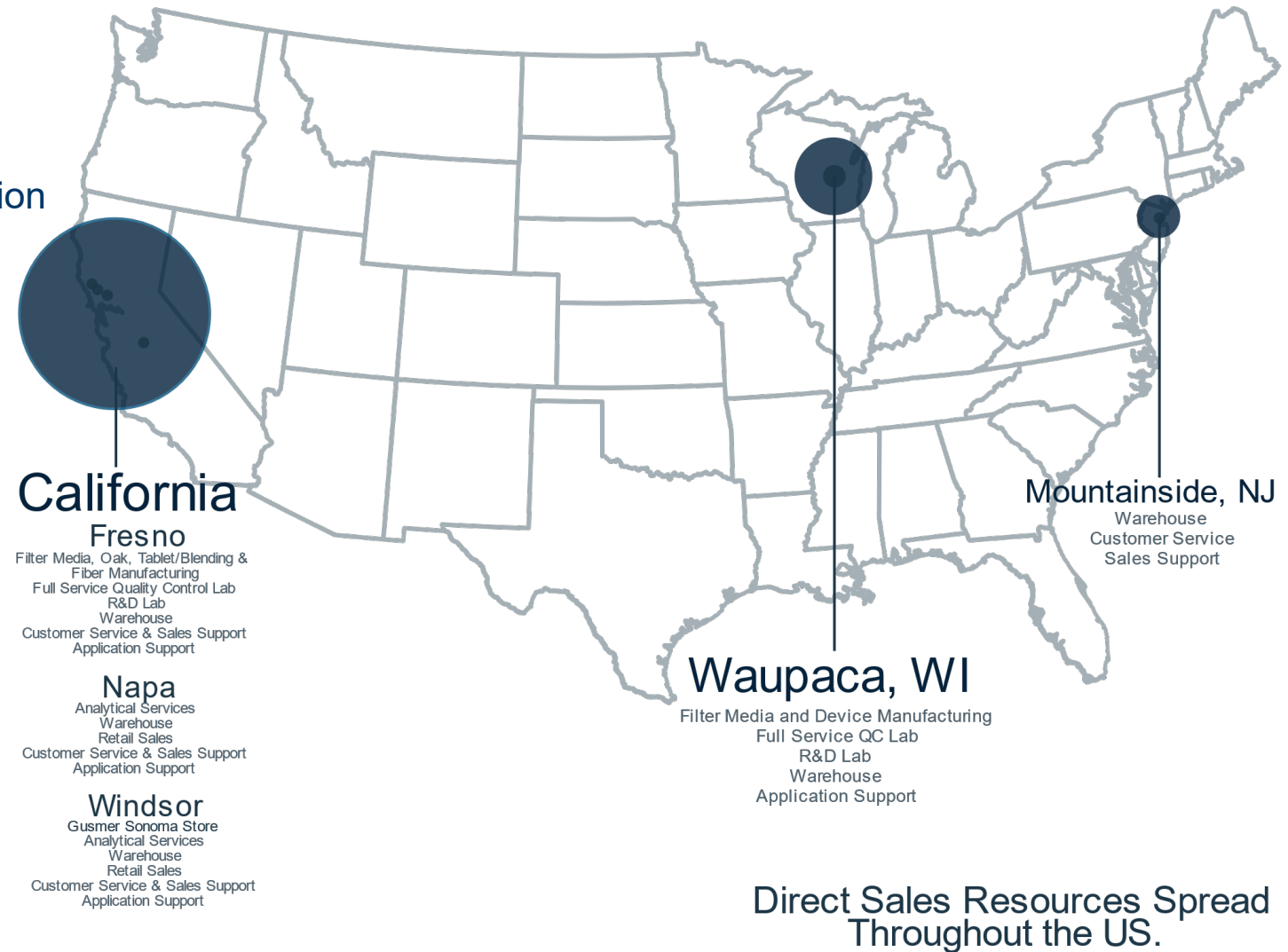
FERMENTATION & FILTRATION PRODUCTS AND SERVICES for FOOD, BEVERAGE & BIOTECH/PHARMACEUTICAL APPLICATIONS

Manufactured and Resale Products

15 Direct Technical Sales Representatives

4 Product Managers &
3 Application Specialists

16 Research &
Development Scientists



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Tom Mondor

Company: Gusmer Enterprises Inc

Phone Number: (715) 417-0623

Email: tmondor@gusmerenterprises.com

[Brewing](#) [Distilling](#) [WineMaking](#) [Juice Processing](#)

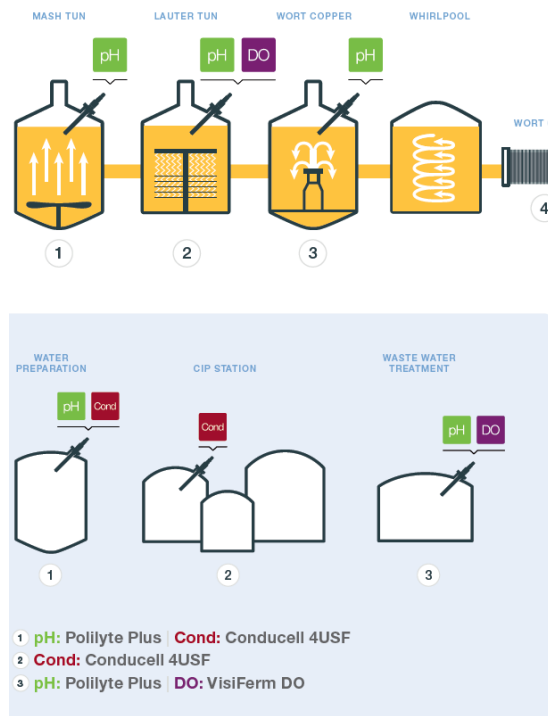
Hamilton Overview

- The Hamilton Company has been manufacturing precision measurement devices for over 60 years
- Partnership between Gusmer and Hamilton was established in 2014
- Gusmer is Hamilton's sole distributor for the beverage industry

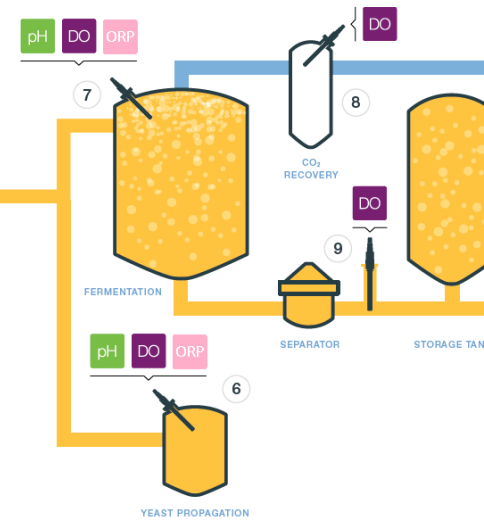


Application Points

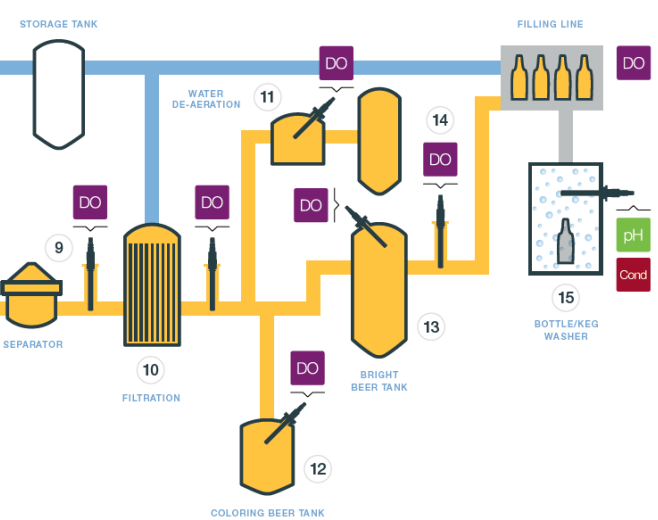
Brewhouse



Fermentation and Storage Cellar



Filtration and Filling



All Hamilton sensors are user friendly and easy to integrate into existing process control systems. Sensors, housings and buffers are compliant with the existing regulations.

- 1 pH: EasyFerm Bio
- 2 pH: EasyFerm Bio | DO: VisiFerm DO
- 3 pH: EasyFerm Bio
- 4 DO: VisiFerm DO
- 6 pH: EasyFerm Bio | DO: VisiFerm DO | ORP: EasyFerm Plus ORP
- 7 pH: EasyFerm Bio | DO: VisiFerm DO | ORP: EasyFerm Plus ORP
- 8 DO: VisiTrace DO
- 9 DO: VisiTrace DO
- 10 DO: VisiTrace DO
- 11 DO: VisiTrace DO
- 12 DO: VisiTrace DO
- 13 DO: VisiTrace DO
- 14 DO: VisiTrace DO
- 15 pH: Polilyte Plus | Cond: Conducell 4USF

Why Measure DO?

- Yeast Health
- Flavor Stability
- Shelf Life



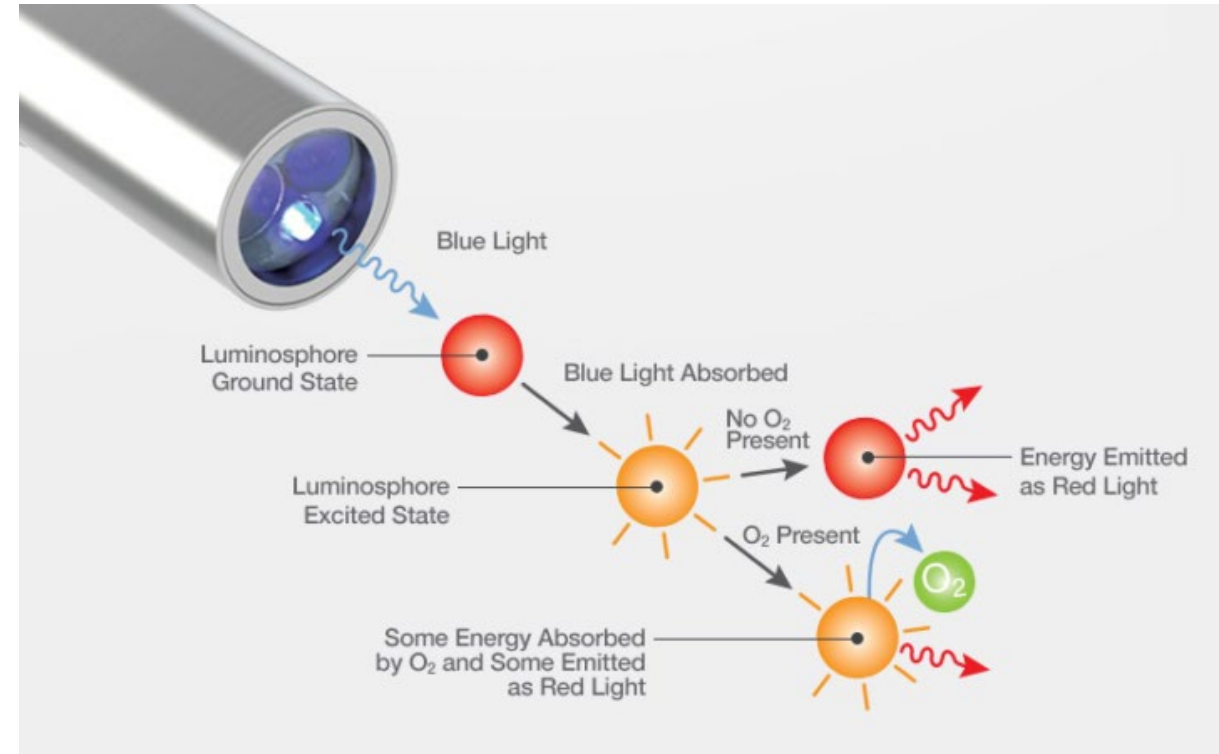
Visiferm mA and Visitrace mA

- ▶ Integrated Transmitter and Bluetooth Communication
- ▶ HART Compatible Two-Wire Loop Connection
- ▶ Visiferm mA
 - 10 ppb up to 25 ppm
 - Convex H4 cap available for increased resistance against chemicals and bubbles
- ▶ Visitrace mA
 - 0ppb up to 2ppm
 - L1 cap stable against active chlorine and chlorine dioxide
- ▶ Both sensors can be CIP



Optical Technology

- ▶ Oxygen sensitive luminophore
 - Excited by blue light and returns red light
 - Red light is absorbed by Oxygen
 - Difference between blue and red light is used to calculate dissolved oxygen
- ▶ Improved response and drift over older Polarographic technology (Clark Electrode)
 - Less maintenance – sensor caps replaced every 12–18 months



Sample Points

- Sufficient oxygen is key to a healthy fermentation
- Can be used with all types of systems
- Allows user to monitor and adjust O2 levels in real time
- Can be tied into existing PLC/HMI systems for complete automation
- CIP
- Sensors are easy to add
- Monitor dissolved oxygen to ensure yeast remains in an aerobic state
- This ensures maximum biomass growth and reduces alcohol produced by yeast
- Utilize existing PLC/HMI to inject air/oxygen only when needed

Visiferm mA – Wort Aeration

Visiferm mA – Yeast Propagation

Sample Points

- After fermentation, oxygen is detrimental to beer and causes stability and staling issues
- Pre- and Post- filtration/separation monitoring is key
- Common sources of oxygen are numerous
- These problems can occur during a run so real time monitoring is key
- Monitoring DO between bright tank and packaging line is also crucial
- Other sources of oxygen ingress
- High cost of packaging downtime means real time inline monitoring is important

Visitrac mA – Filtration/Separation

Visitrac mA - Packaging

Sample Points

- ▶ Monitoring DO on existing or new de-aerated water plants
- ▶ Blending Equipment
- ▶ Bulk CO₂
- ▶ Transfer lines
- ▶ CO₂ Recovery Systems



Visitrace mA – Other

Inline vs. Spot Checks

- ▶ Real Time Monitoring
- ▶ Labor
- ▶ Reduce Beer Loss
- ▶ Data Tracking



Typical DO Values

Sample Point	DO Range
DAW	<20ppb
Wort	10-20ppm (style & gravity dependent)
Post-Fermentation	<20ppb
Post-Filtration/Centrifugation/Transfer	<50ppb
BBT	<20ppb
Packaging Line	<20ppb
CO2	<0.001%

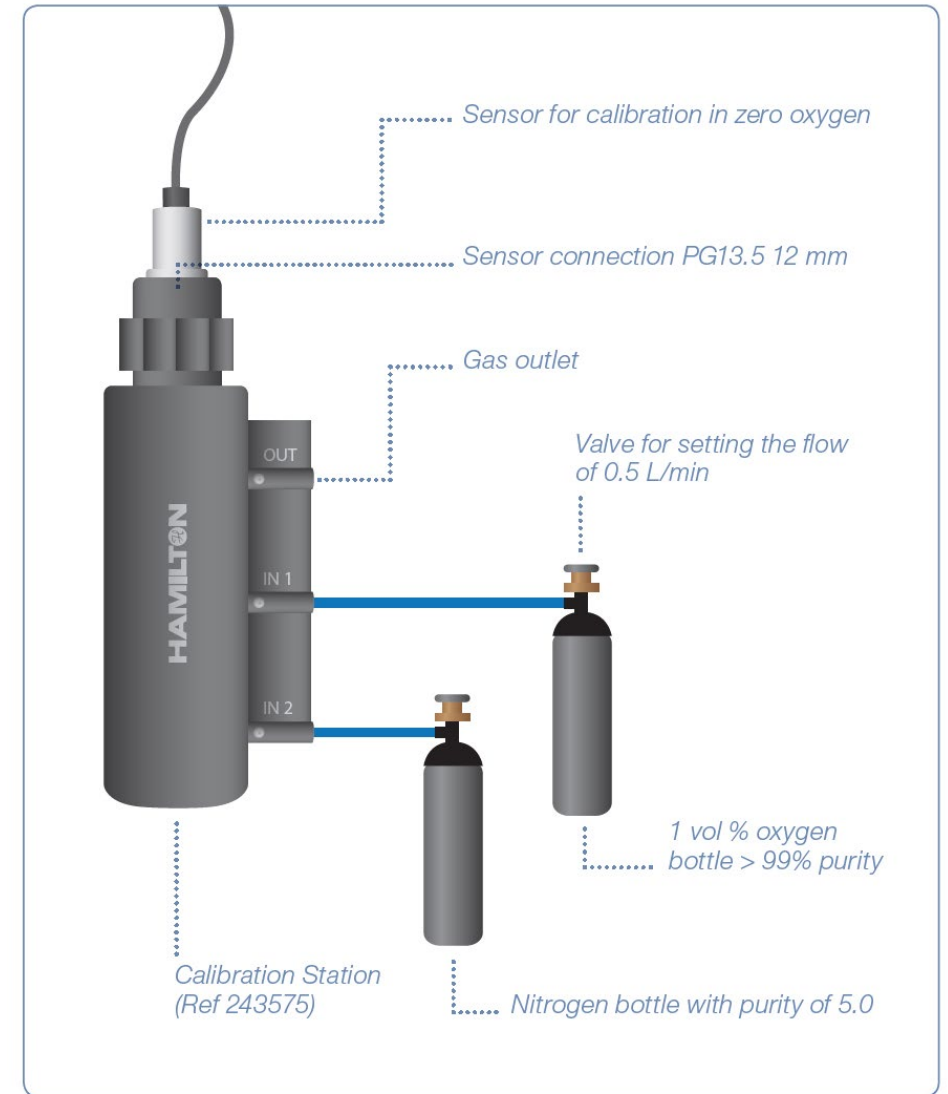
Sensor Housings

- ▶ Tri-clamp and Varivent/Inline fixed place housings
 - Angled (15°) options available for increased cap life
 - Retractable housings also available



Calibration

- ▶ VisiTerm mA
 - Certified 99.999% N₂ and 20.9% O₂ gas standards
- ▶ VisiTrace mA
 - Certified 99.999% N₂ and 1% O₂ gas standards
- ▶ Hamilton Calibration Station or appropriate compatible calibration sensor sleeve
- ▶ Sensor should be clean and dry prior to calibration
- ▶ Quick and convenient calibration using ArcAir software



ArcAir



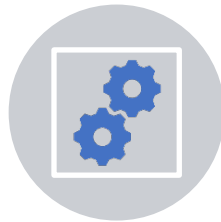
Available on PC
(Windows) and Mobile
Devices (Apple/Android)



Monitor up to 30 sensors
simultaneously



Communicate with
sensors and record data
over time to a PC



Convenient sensor
calibration, configuration,
and troubleshooting



GMP Compatible
reporting, event tracking,
and traceability

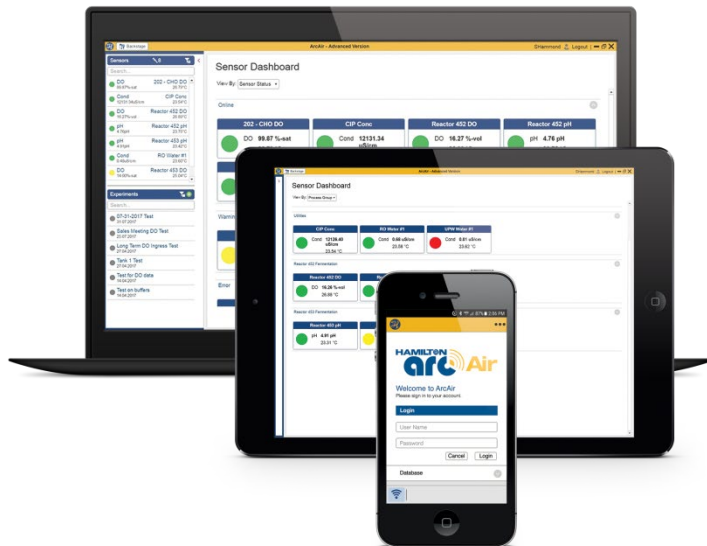


ArcAir

Quick status indicator

- Good
- Warnings
- Errors

Operating indicators



⋮

DO

9.91%-sat

⚠ Warnings: 2

Reactor 453 DO

24.26°C

! Errors:

[Sensor Health](#) i

Quality Indicator	30 %
Operating Hours	3210.43 h
Max. Measurement Temperature	110 °C
Operating Hours Above Max. Measurement Temperature	0 h
Max. Temperature	130 °C
Operating Hours Above Max. Temperature	0 h
Number of SIP Cycles	0
Number of CIP Cycles	0
Number of Autoclavings	0

[Warnings and Errors](#) i

Calibration Warnings	DO: Calibration recommended, DO: Last calibration was not successful
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81 – 100%	Excellent
61 – 80%	Good
46 – 60%	Acceptable
36 – 45%	Poor
< 35%	Replace

- App and PC
- Lite functionality
- Sensor calibration and configuration
- Automatic documentation of each configuration and calibration

Warning text strings

DO: Calibration recommended,
DO: Last calibration was not
successful



Questions?



www.GusmerBeer.com/hamilton-webinars

- **Tuesday, March 9th, 1pm EST**
Using pH and Conductivity to Enhance Brewing Quality & Sustainability
- **Tuesday, March 23rd, 1pm EST**
The Role of Oxidation-Reduction Potential in the Fermenter

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Brewing

Distilling

WineMaking

Juice Processing

Thank You!

