



Gusmer
Enterprises, Inc.®

Water Deaeration
Denwel Series #4



Agenda

- Gusmer & Denwel Overview
- Water Deaeration Overview
- General Tips
- System Options
- Q & A – Type questions in the Q/A box





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



Founded in 1918

Management and Ownership currently in 3rd generation

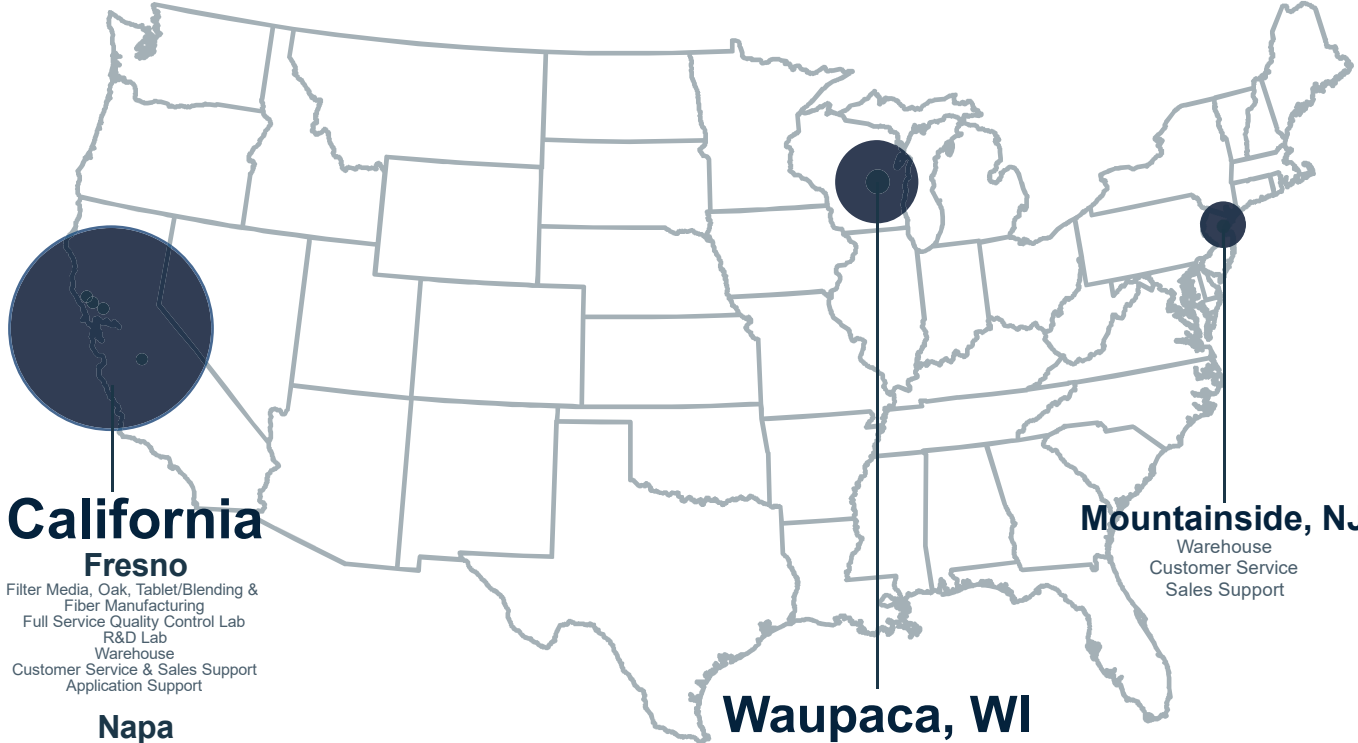
FERMENTATION & FILTRATION PRODUCTS AND SERVICES for FOOD, BEVERAGE & BIOTECH/PHARMACEUTICAL APPLICATIONS

Manufactured and Resale Products

15 Direct Technical Sales Representatives

4 Product Managers & 3 Application Specialists

16 Research & Development Scientists



California

Fresno

Filter Media, Oak, Tablet/Blending & Fiber Manufacturing
Full Service Quality Control Lab
R&D Lab
Warehouse
Customer Service & Sales Support
Application Support

Napa

Analytical Services
Warehouse
Retail Sales
Customer Service & Sales Support
Application Support

Windsor

Gusmer Sonoma Store
Analytical Services
Warehouse
Retail Sales
Customer Service & Sales Support
Application Support

Santa Rosa

Gusmer Fermentation Center

Waupaca, WI

Filter Media and Device Manufacturing
Full Service QC Lab
R&D Lab
Warehouse
Application Support

Mountainside, NJ

Warehouse
Customer Service
Sales Support

Direct Sales Resources Spread Throughout the US.



DENWEL



Overview:

Founded in 1997, DENWEL is a privately owned, independent company with headquarters in Prague and manufacturing facilities in Havlickuv Brod, Czech Republic. The owners and founders are still involved in the day-to-day operations of the company and oversee sales development and technical development/engineering, respectively. Although the core focus of the company remains in the brewing industry, DENWEL has been a respected global supplier to the beverage, pharmaceutical, chemical and energy industries for over two decades.

Although the company's capabilities are vast and include the ability to custom engineer many types of equipment, DENWEL specializes in the following types of standardized, skid mounted equipment:

- Inline gas injection
- Water Deaeration
- Blending and additive dosing equipment
- Flash Pasteurization
- CIP skids and systems





Why do we want water with no oxygen?

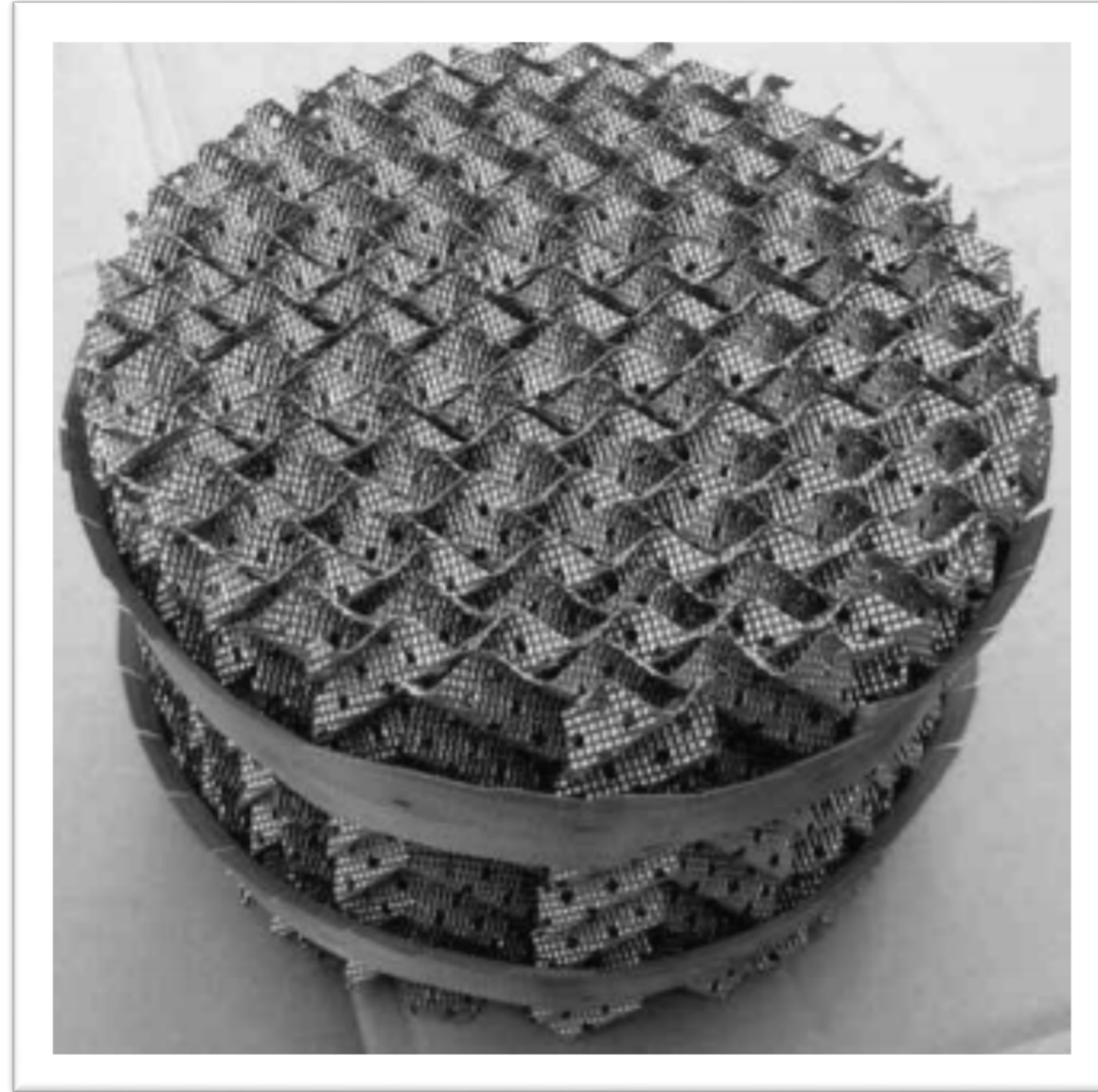
- Any time you move beer (Primary > Secondary > Centrifuge/Filtration > BBT > Packaging) you risk exposing beer to oxygen
- Oxygen, through various chemical reactions, negatively affects beer
 - Color (High DO in NEIPA)
 - Flavor (Wet cardboard, sherry, stale flavors)
 - Haze Stability (Colloidal issues with metal ions, permanent haze)
- Oxygen is highly reactive and a tiny amount will ruin your beer (ppb not ppm)



Column Water Deaeration Overview

- Water flows into the top of the column
- The column is filled with high efficiency structured packing which ensures a large surface/contact area between water and stripping gas
- CO₂ or N₂ flows into the bottom of the column
- Dissolved oxygen is removed as the water and gas flow counter to each other
- Gas phase oxygen leaves with stripping gas at the top of the column

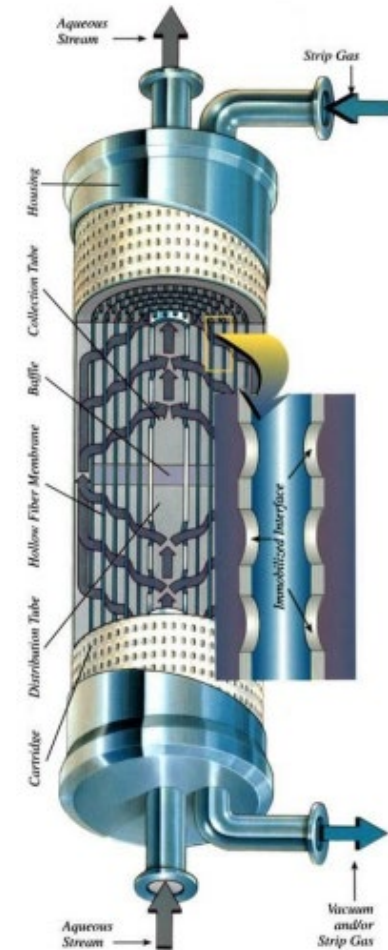






Membrane Water Deaeration Overview

- The membrane contains thousands of microporous hydrophobic hollow fibers
- They form a large internal surface ensuring a maximal contact area between gas and liquid
- CO₂ or N₂ is applied on the inside of the hollow fibers and is pulled out by a vacuum
- The water flows in counter current on the outside of the fibers
- The high difference in partial pressure forces the oxygen out of the water





Where can you use DAW?

- High Gravity Brewing
- Purging of Pipes
- Purging of Centrifuges, Filtration and Can/Bottle Fillers
- Mix Tanks (DE, Silica, PVPP, Colloidal Silica, Stabilizers)
- Push beer from one process to another
- Yeast Pitching and Collection
- BBT CIP and Final Rinses



Application Tips

- Batch Style or On Demand
- Cold Water Column style imparts some carbonation but more is possible
- Setup recirculation loop with buffer tank and add DAW drops around your facility
- Recover more beer during filtration or centrifugation
- Use it everywhere that comes in contact with finished beer



System Options

- Cold Column ($O_2 < 10\text{ppb}$)
- Membrane ($O_2 < 10\text{ppb}$)
- Stripping Gas: either CO_2 or N_2
- Semi-Automatic: system starts up and begins production automatically, when dissolved O_2 parameters are met



Available Optional Features

- O₂ analyzer-for precise feedback
- Ice Water or Glycol Cooling-if water source is too warm
- Pre-Carbonation (+1-4g/l CO₂ in DAW)



Water Deaeration Column Cold

- DWDXXC-Water Deaeration Column Cold
- Dissolved O₂- <10ppb
- DWDXXC range of sizes from 1"-5" (DN 25-DN 125)
- DWDXXC range can produce DAW from 4-852 bbl/h (4-1000hl/h)
- High Surface Area Structured Stainless Packing
- Semi-Automated control for easy/reliable production
- Operating Temperature 8-30°C/40-90°F
- Convenient Skid Mounting, dimensions* from:
h=5.5m x w=1m x d=0.5m

*custom dimensions may also be possible





Water Deaeration Membrane

- DWDXXM-Water Deaeration Membrane
- Dissolved O₂- <10ppb
- DWDXXM range of sizes from 1"-2.5" (DN 25-DN 65)
- DWDXXM range can produce DAW from:
4-170bbl/h (4-200hl/h)
- Large Surface Area Hydrophobic Membrane Contactor
- Semi-Automated control for easy/reliable production
- Operating Temperature 8-30°C/40-90°F
- Excellent option for tight spaces
- Convenient Skid Mounting, dimensions* from:
h=1.6m x w=0.7m x d=0.6m

*custom dimensions may also be possible





Questions?



www.GusmerBeer.com/denwel-webinars

Upcoming

- **Tuesday, August 10th, 1pm EST**
CIP: Make Your Life Easier

Past Webinars

- **Maximizing Fermentation through efficient wort Aeration/Oxygenation**
- **Improving efficiency and mastering your spec with Denwel's carbonation and nitrogenation systems**
- **Inline Carbo-Blending & Dosing Systems: Enhancing Hard Seltzer & High Gravity Beers**



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Thank You!

