Cross Flow Filtration in Winemaking

Dave Gusmer - Gusmer Enterprises, Inc.
Benoit Murat - Bucher Vaslin North America
Chris Bertsche - Winemaker, Coelho Winery

Tuesday , July 21, 2020

Gusmer Enterprises, Inc.

Agenda

- What is Cross Flow filtration?
- Why is Cross Flow popular?
- Advantages of Bucher Vaslin System
- Q&A- Winemaker, Chris Bertsche
- Review any of your questions
- Benoit Murat- Bucher Vaslin NA

Gusmer Enterprises, Inc.

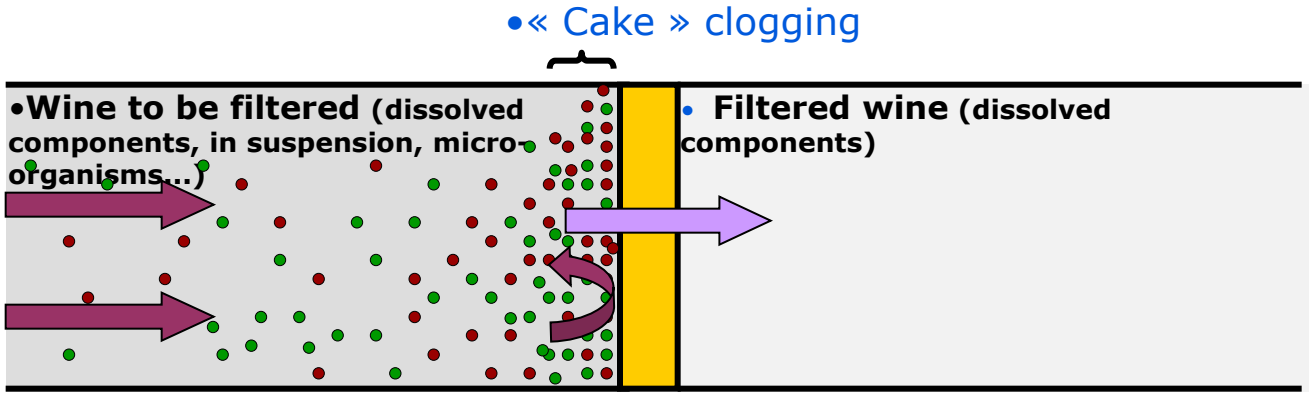
What is Cross Flow Filtration?

- Also called Tangential Flow Filtration "T.F.F."

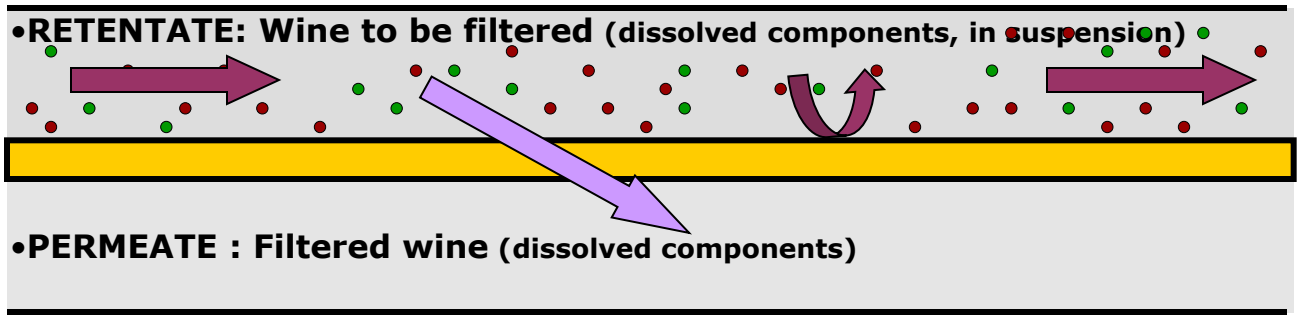
- Definition: method of clarification where product flow is parallel to the filter surface to minimize clogging, and maximize efficiency

Gusmer Enterprises, Inc.

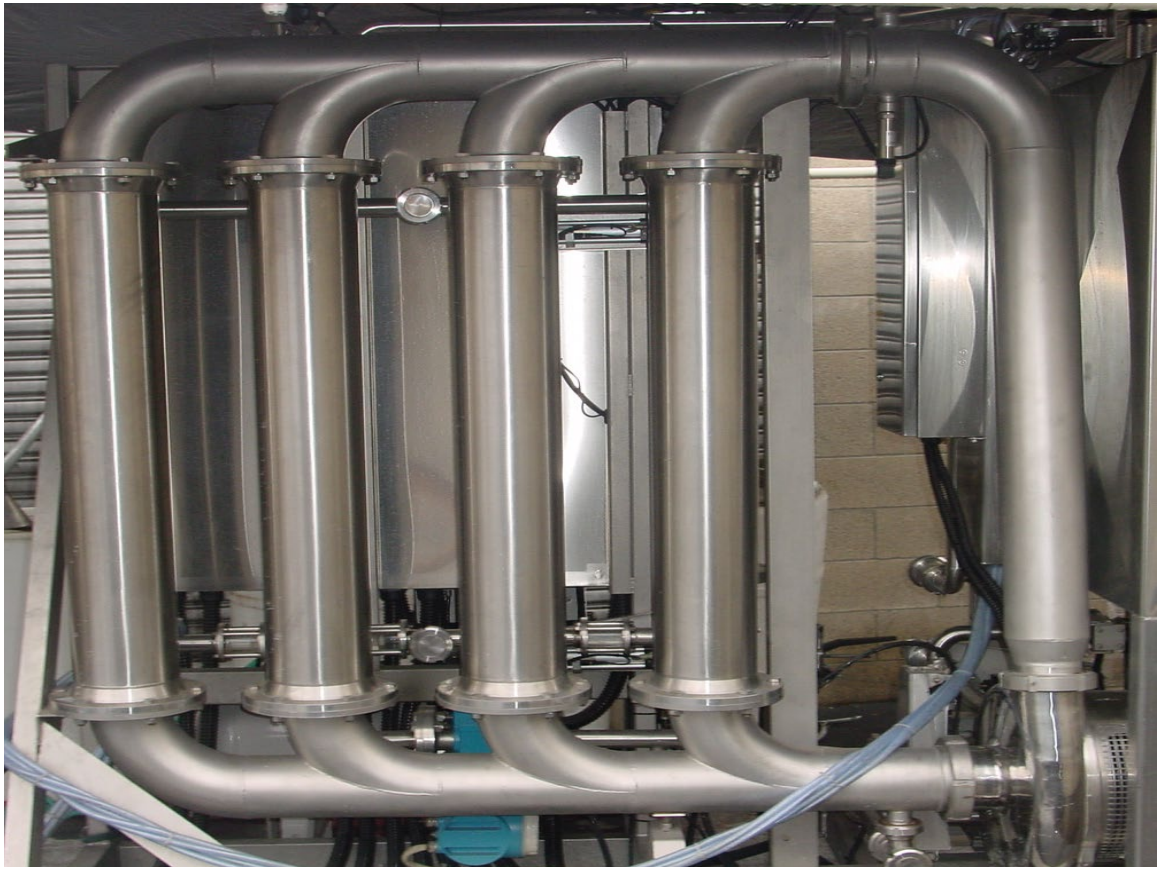
•- Dead-end filtration



•- Cross flow filtration

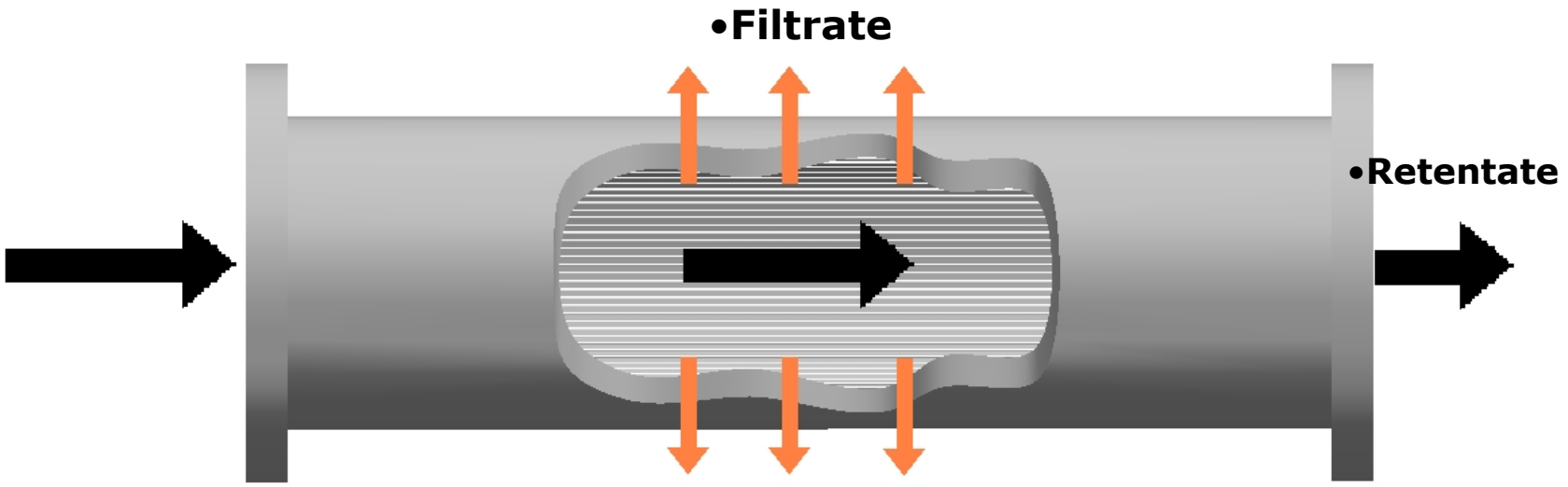


Gusmer Enterprises, Inc.



Gusmer Enterprises, Inc.

Gusmer Enterprises, Inc.

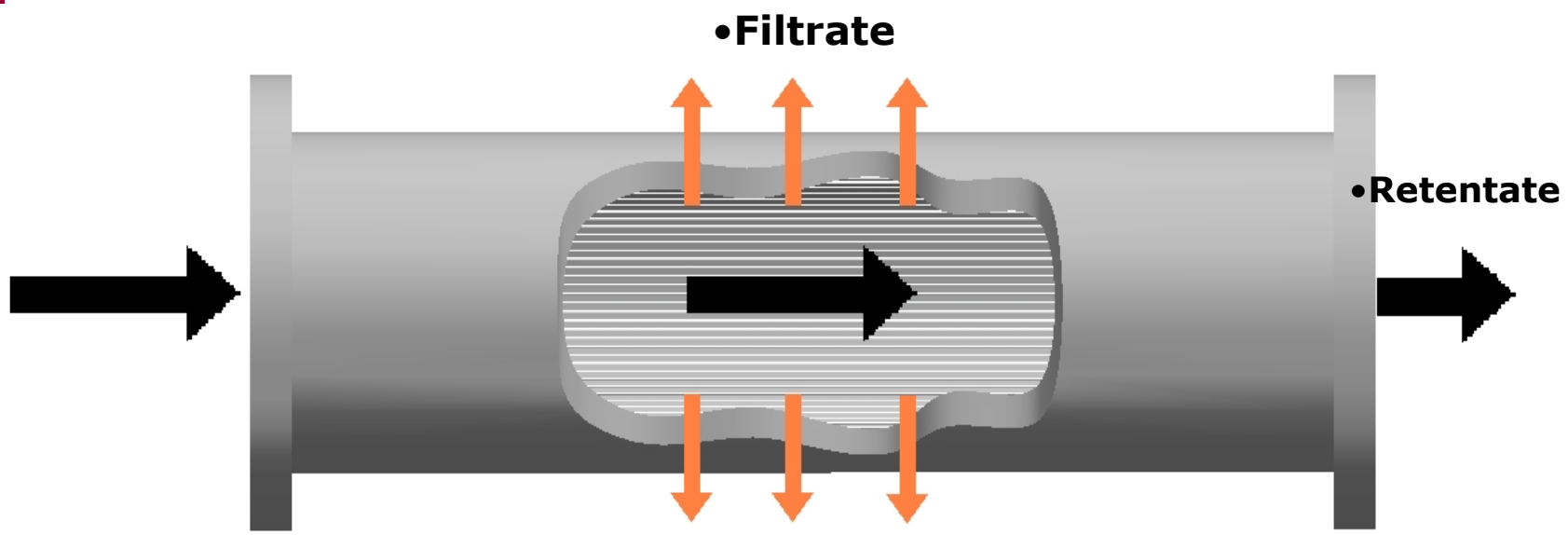


Only part of the liquid crosses the membrane on each passage

•**Retentate** = Coarse components, bigger than the diameter of the pores of the membrane

•**Filtrate (permeate)** = Filtered Wine.

Gusmer Enterprises, Inc.



-During the course of the filtration, your retentate is becoming more concentrated with solids

-At the end of the filtration, you are left with filtered wine, and your retentate with the solids

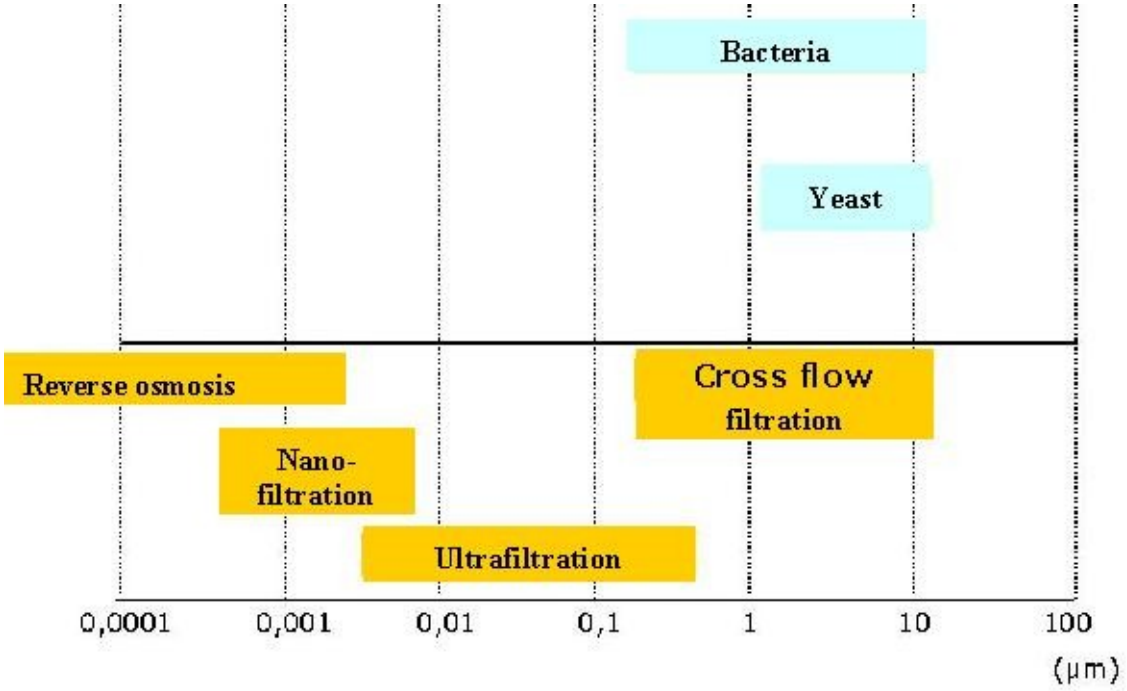
Gusmer Enterprises, Inc.

What Size are the Particles in Wine?

- Grape Solids, Tartrates, Fining Agents
  - 100 to 1,000 microns
- Colloidal or Precipitated Proteins
  - < 0.2 to 5 microns
- Yeast and Bacteria
  - 0.65 to 3 microns

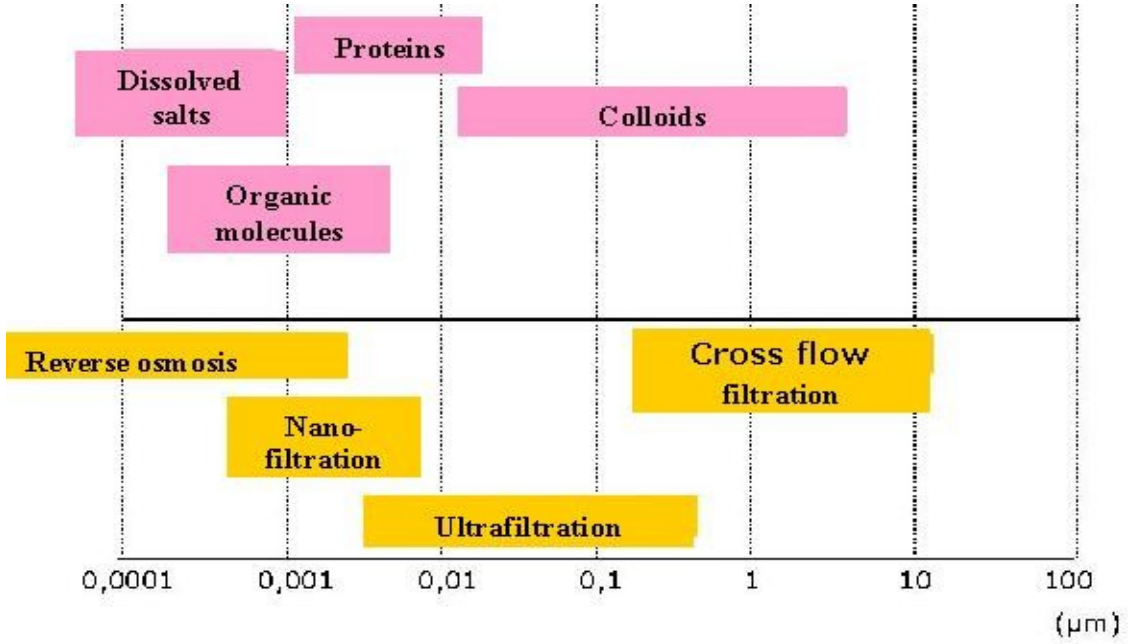
Gusmer Enterprises, Inc.

Cross Flow Removes Yeast and Bacteria



Gusmer Enterprises, Inc.

Cross Flow allows desireable components to pass through the membrane



Gusmer Enterprises, Inc.

Advantages of Cross Flow

- One Pass Filtration
- Minimal Wine Transfer- less oxidation
- Improved Wine Quality (flavor/aroma)
- Minimal Wine Loss
- Minimal Color Loss

Gusmer Enterprises, Inc.

Advantages of Cross Flow

- Time & Labor Savings- 1 x person
- Longer Membrane Life on Cartridges
- No need for filter aids- cost savings
- No flavor issues with DE or sheets
- No health/disposal issues with DE

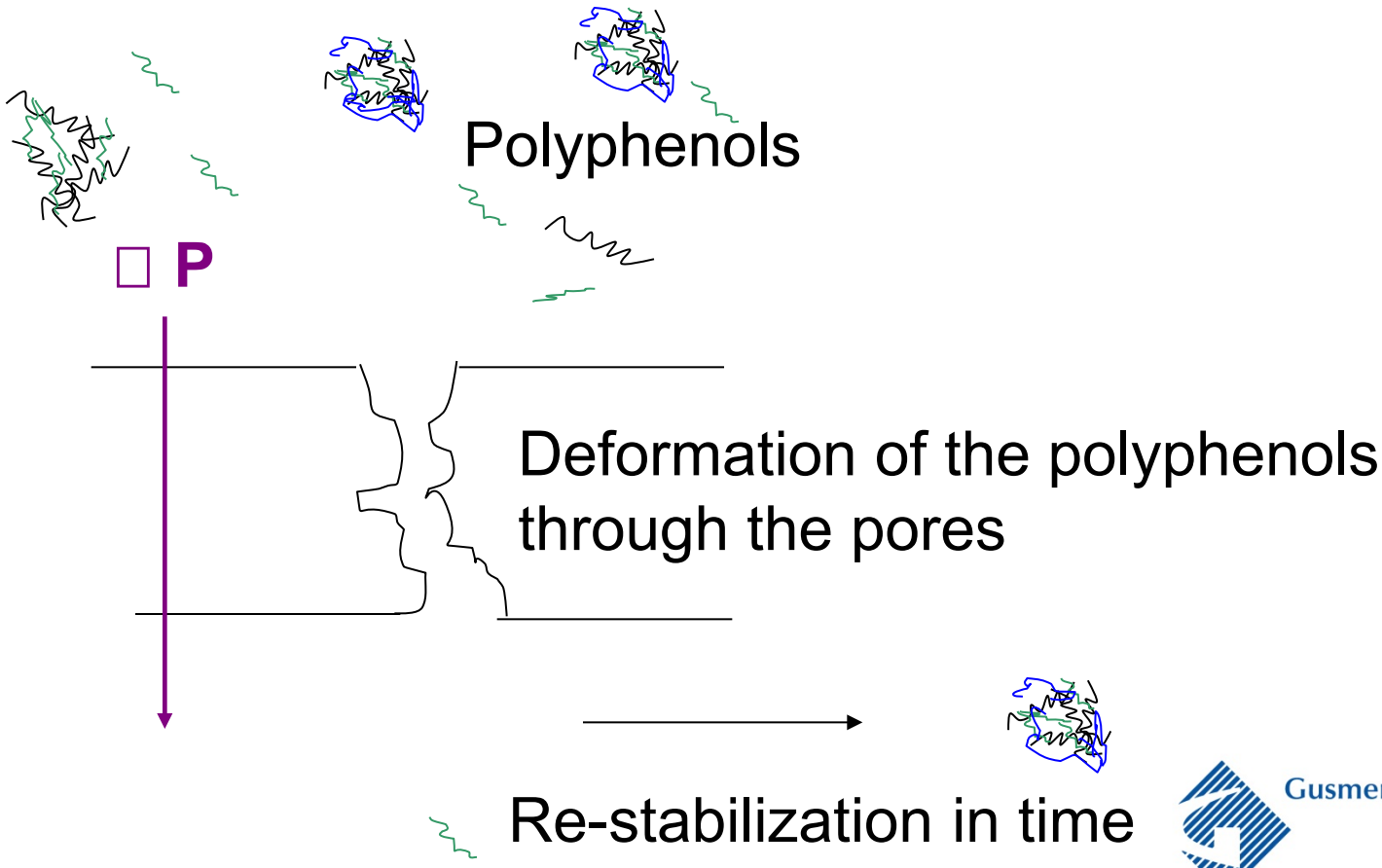
Gusmer Enterprises, Inc.

Cleaning

- Caustic most common
- Non chlorinated-Hydrogen Peroxide
- Enzymes
- Make sure your water is clean!

Gusmer Enterprises, Inc.

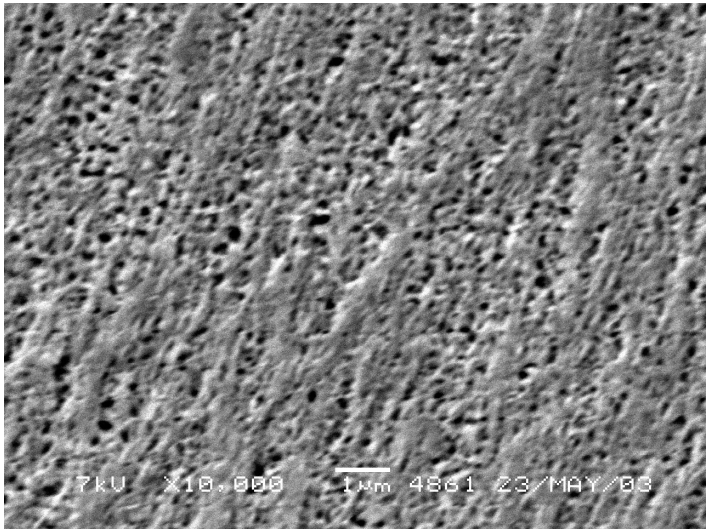
Comportment of Polyphenols



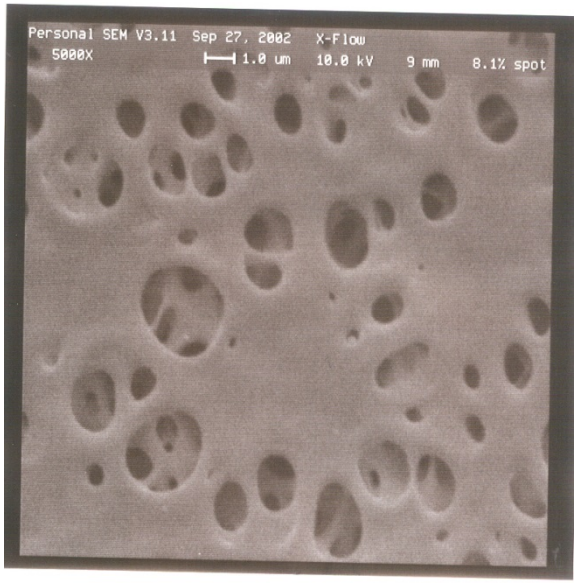
Gusmer Enterprises, Inc.

How is Bucher Vaslin Unique?

PES Membrane - specific for Wine



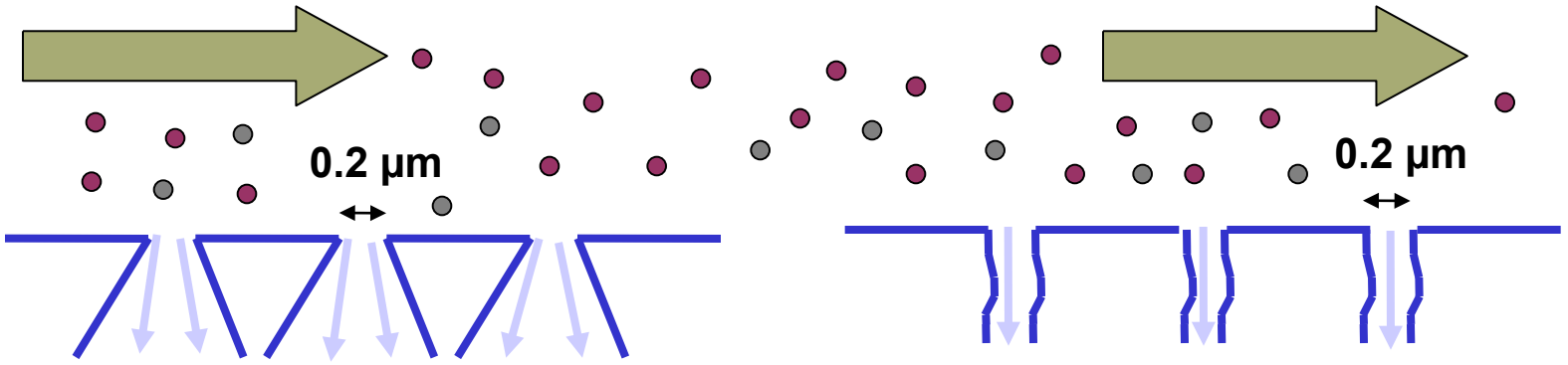
- **Inner structure x 10 000**



- **Outer structure x 5000**

Gusmer Enterprises, Inc.

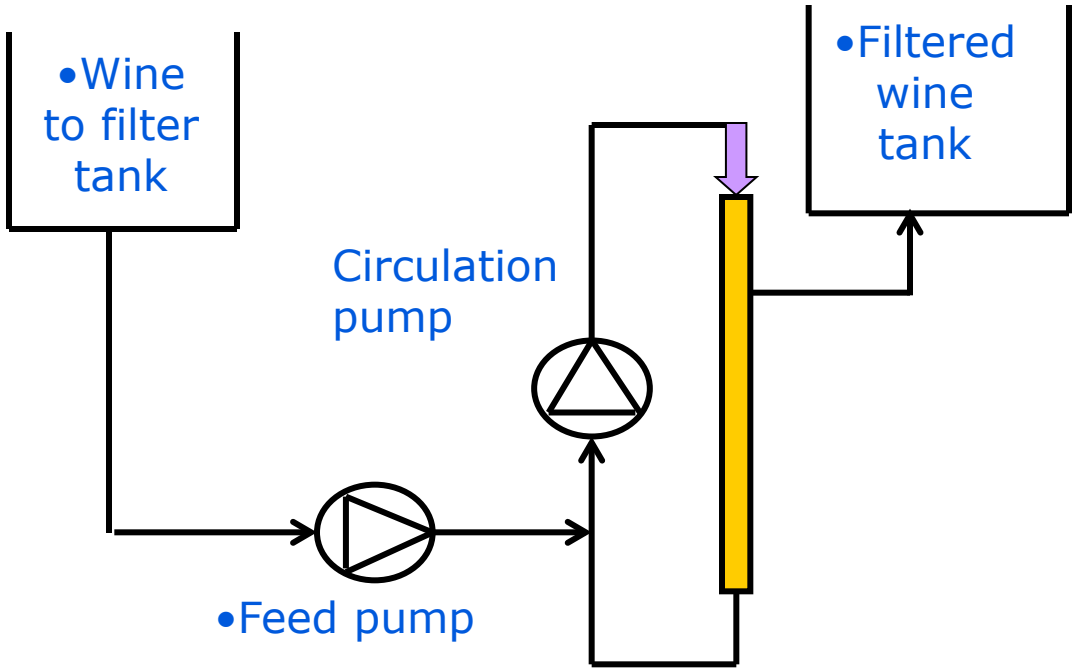
.2 micron asymmetric membrane



Permeate : Filtrate (dissolved compounds)

Gusmer Enterprises, Inc.

Low Pressure- max 1.2 bar

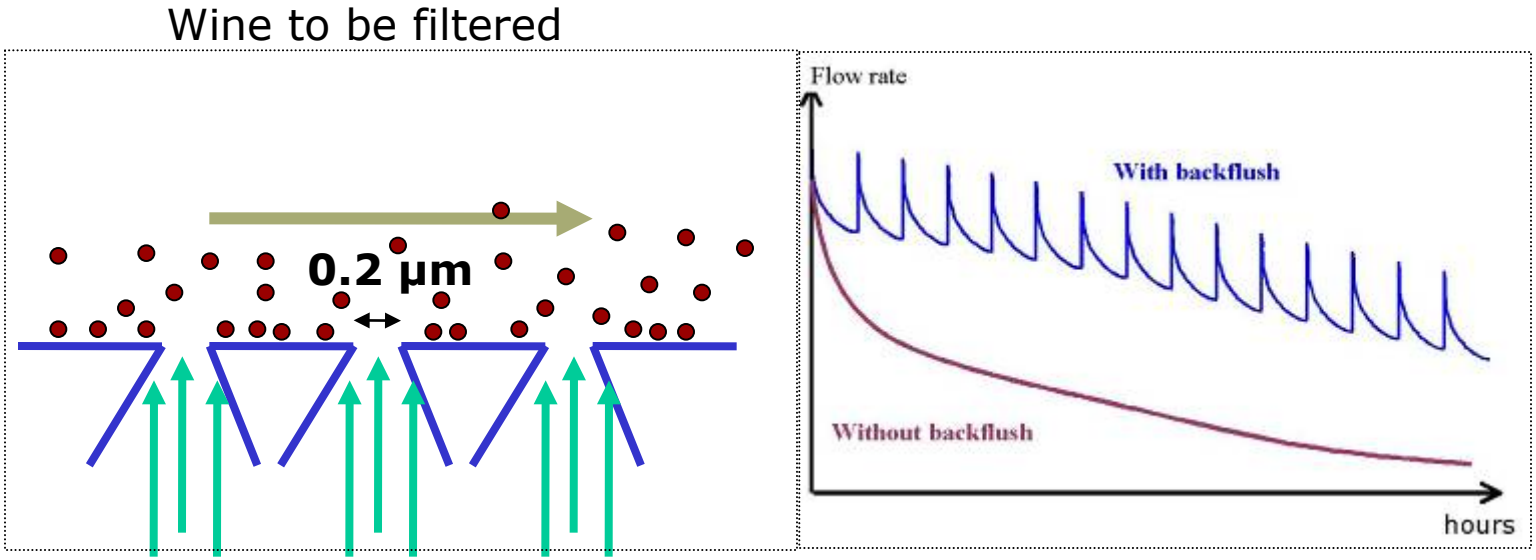


Gusmer Enterprises, Inc.

Unique Back-Flush Process

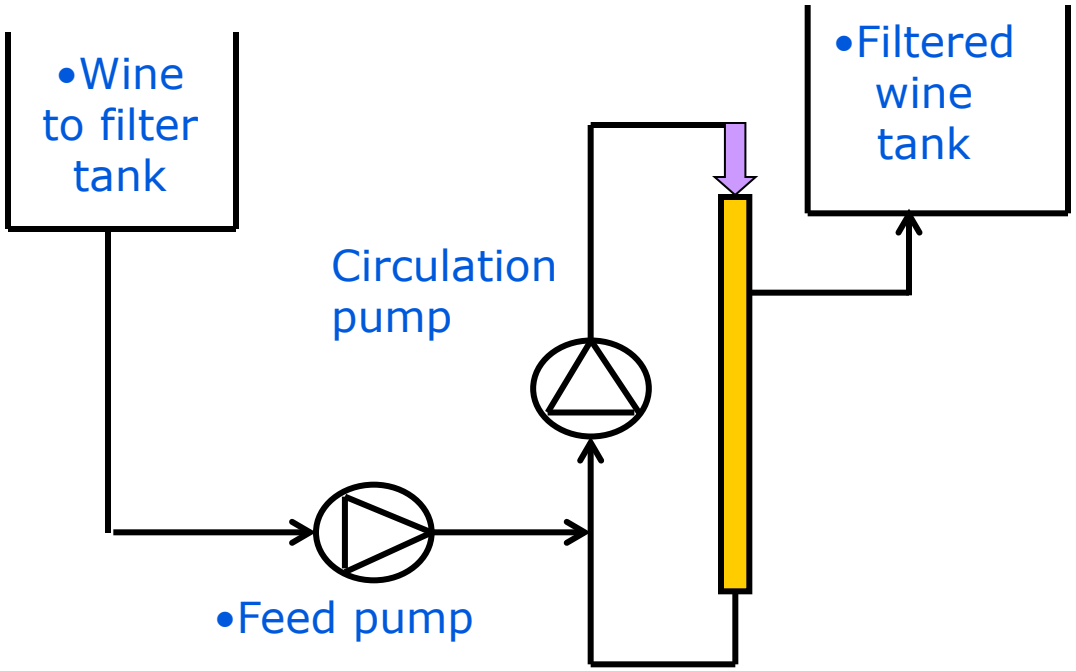
Surface Deposits remain in suspension

Consistent 0.2 µm rating for entire filtration



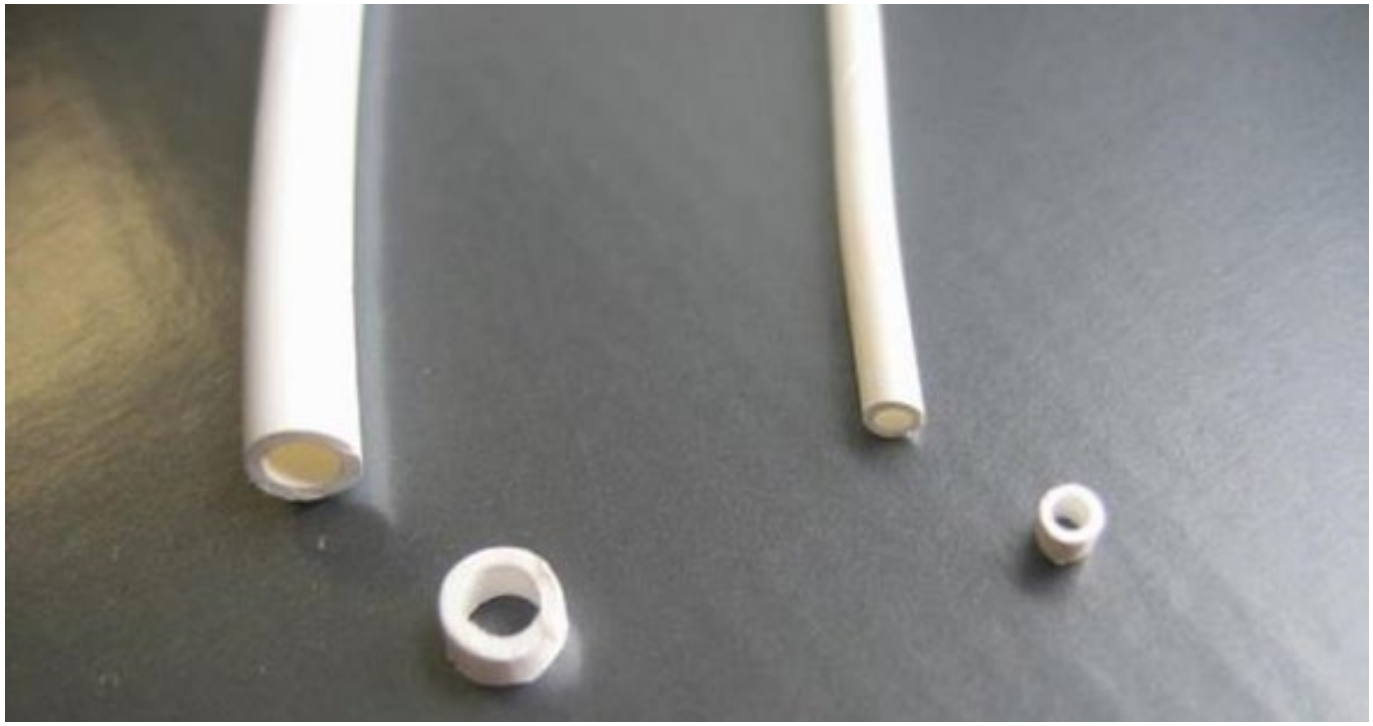
Gusmer Enterprises, Inc.

Simple 2 pump Design



Gusmer Enterprises, Inc.

Ability to Process Juice Lees



Gusmer Enterprises, Inc.

Ability to Process Juice Lees

BUCHER vaslin

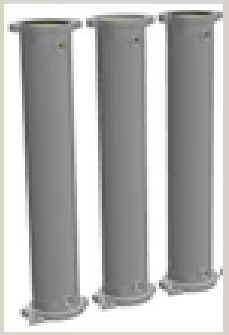
The Juice lees filter

Upper motorized manifold

D3 Automatic rotary pre-filter

Flavy FX1/2/3 filtration unit

3 mm ID capillaries modules



Gusmer Enterprises, Inc.

Gusmer Enterprises, Inc.

Bucher Vaslin Advantages

- PES Membrane Specifically for Wine
- Operates at low pressure to prevent heating
- Back Flush design increases flow rates
- Fully Automated- can run overnight
- Ability to Process Juice Lees

Gusmer Enterprises, Inc.

Bucher Vaslin Advantages

- Simple design- 2 pump system
- Lowest water consumption on the market
- Water prefilter on every machine
- Ability to filter sparkling wines
- Ideal for difficult to filter wines

Gusmer Enterprises, Inc.

Bucher Vaslin Options

- Conductivity Probe for Chemicals
- Nitrogen Injection (decarbonate)
- Injection of UF Bentonite
- Injection of Oenological Products
- Tank Management- 2 inlets 2 Outlets
- Tandem Concept- minimizes wine loss
- Winect Mobile Application

Gusmer Enterprises, Inc.

Bucher Vaslin Summary

- Flow rates FX2 = 200- 600 GPH
- Flow rates FX300 = 3,000-9,000 GPH
- FX2 price starting at $ 75,000
- No better filter to protect wine quality
- Bucher best on difficult to filter wines
- Over 100 Bucher filters in the U.S.

Gusmer Enterprises, Inc.

Q&A: Bucher Vaslin Reference

Chris Bertsche

Winemaker, Coelho Winery

Amity, Oregon

Gusmer Enterprises, Inc.

QUESTIONS?

Gusmer Enterprises, Inc.

Contact Information

Dave Gusmer- Director of Beverage Sales

dgusmer@gusmerenterprises.com

Calvin Watkins- Gusmer Product Manager

cwatkins@gusmerenterprises.com

Please contact your local Gusmer Sales Rep!

Gusmer Enterprises, Inc.

Thank You!

Gusmer Enterprises, Inc.