

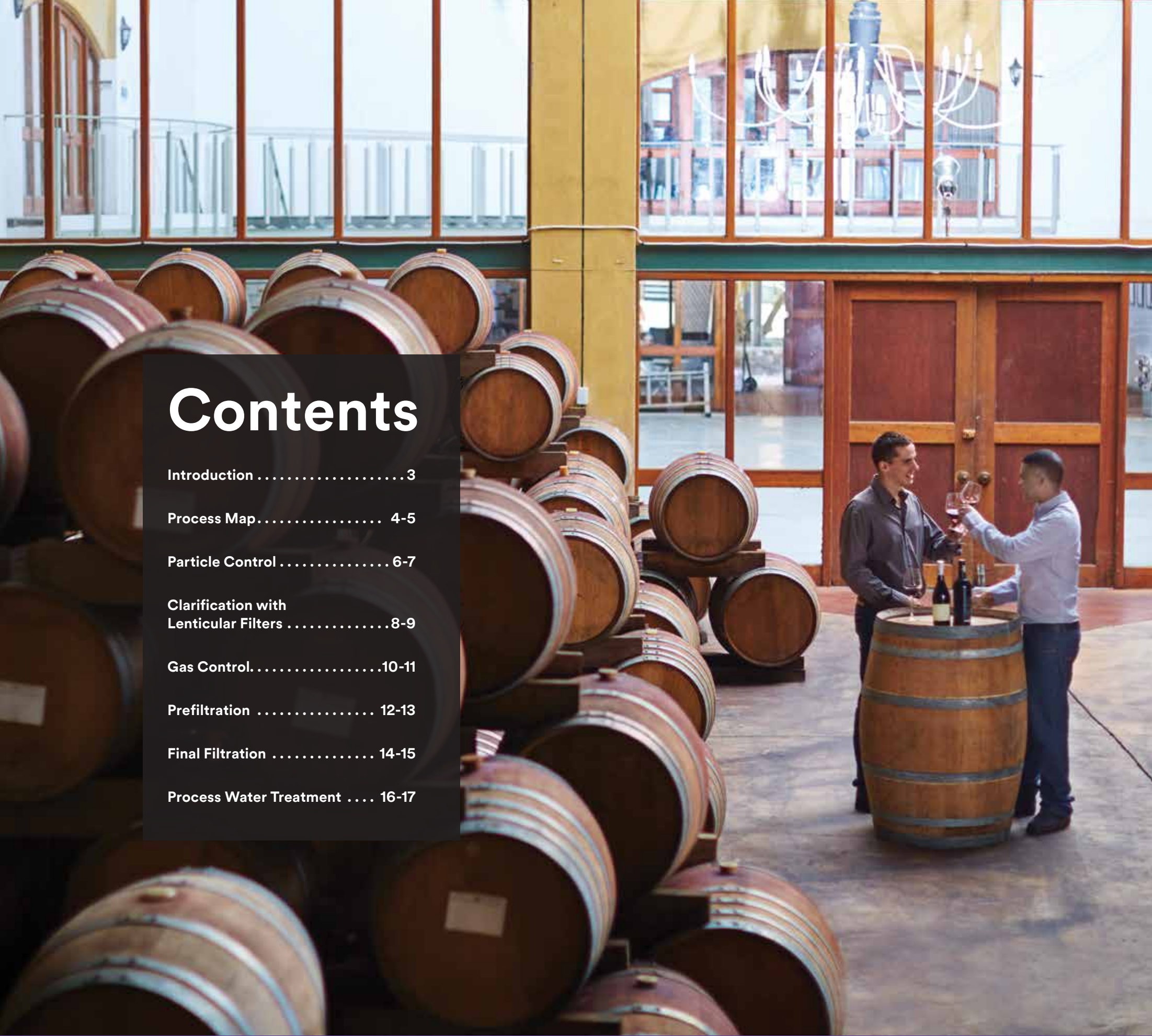


Science.
Applied to Life.™

3M Separation and Purification Sciences Division

Uncork a better bottle.

Pour on the possibilities with innovative filtration and gas control solutions for wine production from 3M.



Contents

Introduction 3

Process Map..... 4-5

Particle Control 6-7

Clarification with Lenticular Filters 8-9

Gas Control..... 10-11

Prefiltration 12-13

Final Filtration 14-15

Process Water Treatment 16-17

Blending tradition with innovation.

A fine wine is more than just the sum of its ingredients. This is why 3M works directly with individual producers to define an ideal system for clarification, prefiltration and final filtration. With cost-effective, efficient and reliable solutions, there's a reason wine producers all over the world choose 3M filtration and separation systems.

Performance

- Help improve product consistency for everything from clarity to stability
- Efficient products with long service lives and high flow rates
- Excellent contaminant holding capacity

Quality

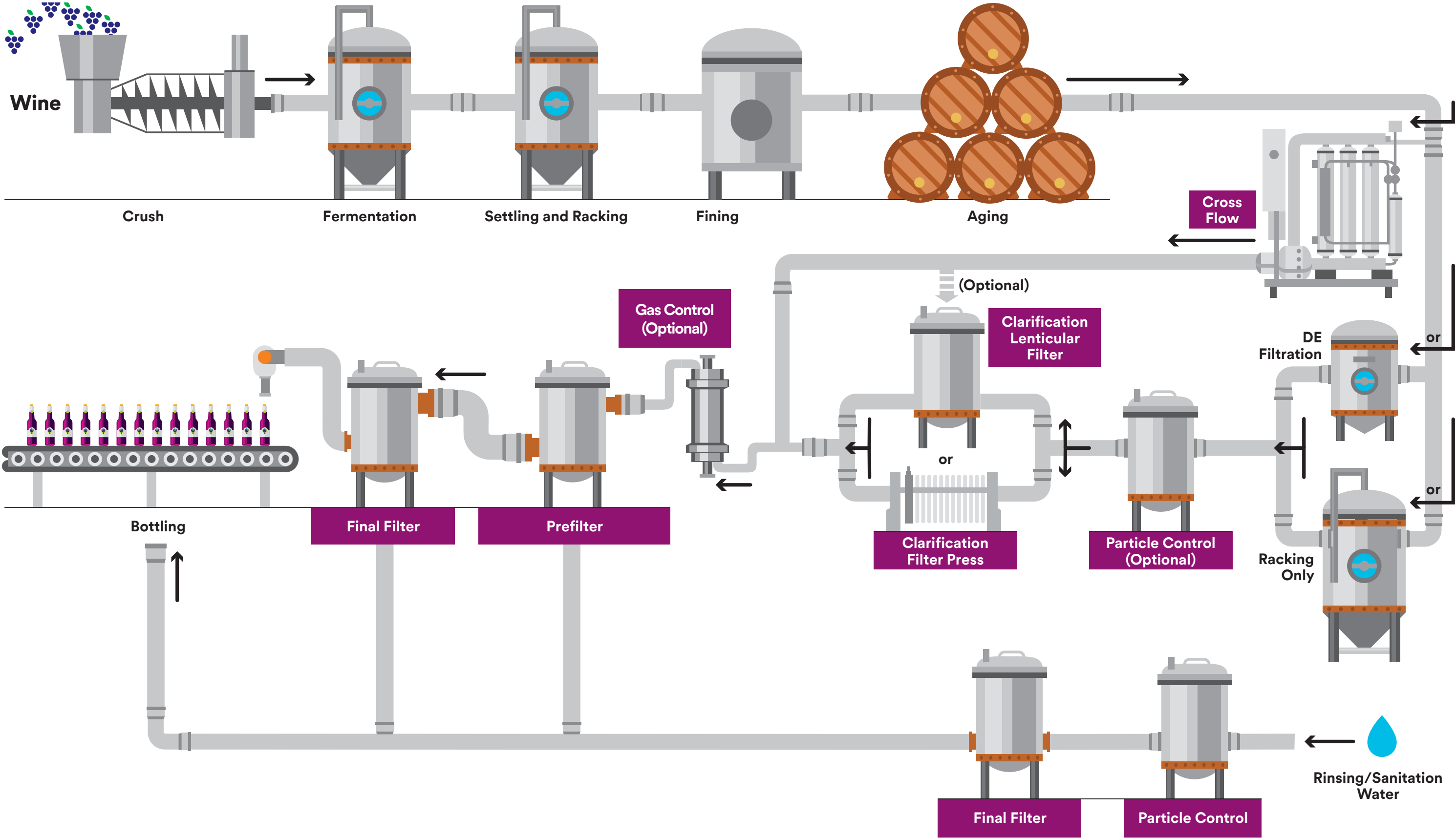
- Certified to ISO 9001 standards
- Help improve taste and consistency
- Rigorous internal validation tests

Convenience

- Designed for ease of use, minimizing labour and system downtime
- Products can be integrated into many types of production lines

Wine Making Process

Here's an example of where filtration and gas control can enhance your wine production process.



3M™ High Flow Filtration Systems

High flow capability in a compact design.

Requiring fewer cartridges and smaller filter vessels than traditional systems, 3M™ High Flow Filtration Systems can be used in particle control applications in water or wine, rough clarification or prefiltration of bulk wine or 3M™ Liqui-Cel™ Membrane Contactors.

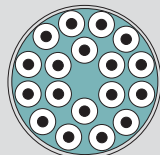
Comparison of Potential Options to Obtain a System Operating at a Rate of 350 gpm (80 m³/Hr)

3M High Flow filtration system



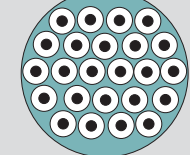
1 cartridge in a housing with a 218 mm (8.6") diameter

63.5 mm (2.5") pleated cartridges



18 cartridges in a housing with a 356 mm (14") diameter

63.5 mm (2.5") depth filters

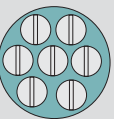


24 cartridges in a housing with a 406 mm (16") diameter

90% fewer cartridges.

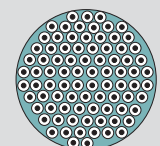
Comparison of Potential Options to Obtain a System Operating at a Rate of 454 m³/Hr (2000 gpm)

3M High Flow filtration system



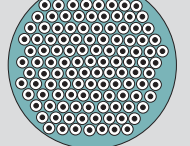
7 cartridges in a housing with a 610 mm (24") diameter

63.5 mm (2.5") pleated cartridges



85 cartridges in a housing with a 762 mm (30") diameter

63.5 mm (2.5") depth filters



120 cartridges in a housing with a 914 mm (36") diameter

Up to **33-50% reduction in housing size.**



3M™ High Flow Series Filters Cartridge Design Features

Quick and Easy Filter Replacement

The user-friendly filter design allows the filters to be replaced in an easier and faster way.

Easy to Use

Ergonomic and handy design, fast and easy to insert and remove without the need for any equipment.

Polypropylene Structure

Provides broad compatibility with different types of fluids.



Radial Pleat Pattern

Maximizes the usable filter surface per cartridge.



High Flow Rate

7.62 cm (3") core permits to 113 m³/hour (500 gpm) through a single 152.4 cm (60") length cartridge. Bayonet attachment ensures easy fitting.



Stop the presses.

Winemakers have used conventional plate and frame filter presses for years, despite their many recognized downfalls. 3M™ Zeta Plus™ Series Filters were designed as a convenient and cost-effective alternative for wine filtration.



3M™ Zeta Plus™ H Series Filters

Charge-modified depth filters constructed with high-tensile strength media.

- High wet-tensile strength filter media withstands multiple steaming and hot water sanitization and regeneration cycles
- Extended filter life can provide high throughputs, fewer change-outs and reduced operating costs
- Provides efficient haze and particle reduction

3M™ Zeta Plus™ MH Series Filters

Designed to provide optimal clarification and prefiltration in wine, 3M™ Zeta Plus™ MH Series Filters are an advanced, dual-zone depth filter.

Their cartridge construction enhances the contaminant holding capacity of the filter by trapping larger particles, hazes and micro-organisms in the upstream layer, and smaller ones in the downstream layer.

- Higher throughput, lower processing costs and smaller filter assemblies
- Dual zone depth filter enhances contaminant loading capacity
- Withstands the rigours of hot water, steam and chemicals for longer service life

3M™ Zeta Plus™ Series Filters vs. Filter Press

	3M™ Zeta Plus™ Series Filters	Filter Press
Leakage	Zero leakage, saves valuable wine — no oxygen/bacteria pick up	Up to 1-2% of volume filtered
Labour	15 minute change-out times	Two to four hour change-out times, reducing productivity
Change-Outs	Changed when filtration capacity achieved, fewer filters needed	Changed based on time on the press
Capital Costs	Typically 25-50% the capital cost of a stainless steel filter press	Filter presses are large, expensive pieces of equipment
Maintenance	Three O-rings, easy to clean and maintain	Four O-rings per plate, heavy plates must be cleaned regularly
Disposal	Fewer change-outs results in reduced disposal costs	Additional disposal costs could be incurred
Floor Space	Small footprint frees up space for other operations	A 60 cm ² press requires up to 9.29 m ² (100 sq. ft.) of floor space
Energy Consumption	Reach sanitation temperatures in about 15 minutes	Reach sanitation temperatures in 30-90 minutes

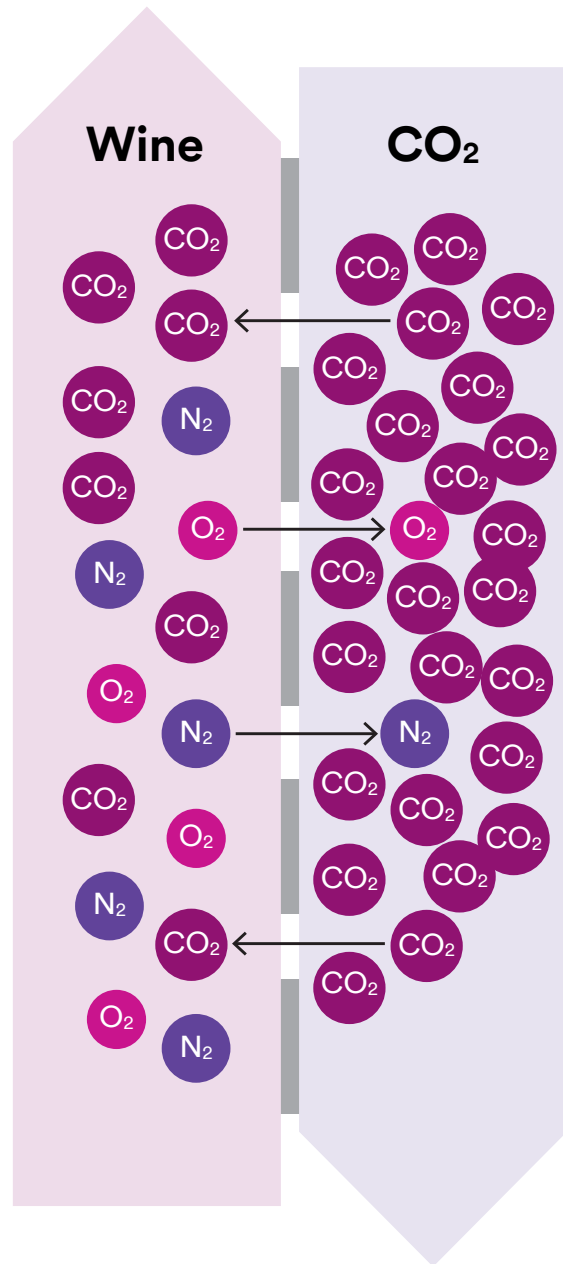


3M™ Liqui-Cel™ Membrane Contactors

Dissolved gas control in a versatile, compact solution.

The taste and consistency of wine are linked to levels of dissolved gas content. Removing oxygen can help extend the product's shelf life, and adding/removing carbon dioxide can make a product taste more pleasant. In general, gas control systems help improve the quality of the product, from the first sip to the last drop.

Meet target product specifications with dissolved gas control.



High Performance and Efficiency

- Predictable, precise gas control that can achieve oxygen concentrations of less than 0.1 mg/l
- Avoid the use of nitrogen gas for sparging and replace N₂ with CO₂

Compact and Versatile

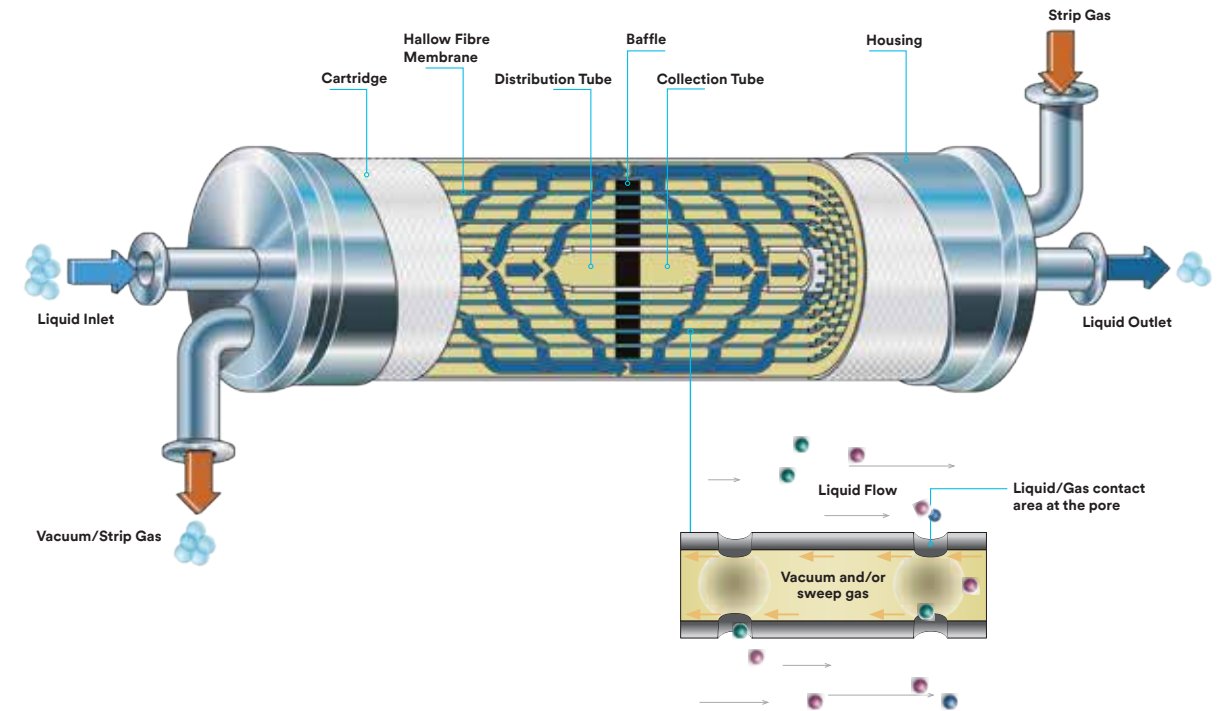
- Can be installed in confined spaces
- Custom and modular system designs
- Can be used in several process phases: directly after clarification, tank to tank or before bottling

Rapid Gas Control

- Can make the use of tanks or pumps redundant
- Helps speed up production processes by minimizing gas control process times

Deoxygenation

Oxygen in wine can compromise its quality and accelerate deterioration. By limiting the amount of O₂ in wine, 3M™ Liqui-Cel™ Membrane Contactors can help protect shelf life and reduce impacts to aroma and taste.



Addition or Removal of Carbon Dioxide

Carbon dioxide affects the taste and sensation on the palate. In-line gas control with 3M™ Liqui-Cel™ Membrane Contactors can help boost operational efficiency while maintaining or improving product quality and consistency.



3M™ LifeASSURE™ BLA Series Filters

Many bottling applications use one or more prefilters and a final filter, arranged in series, to achieve maximum performance and cost reduction.

Technology

By combining a graded-density microporous membrane made of N66 nylon with Advanced Pleat Technology (APT), LifeASSURE BLA series filters guarantee protection for the final membrane filters and extend service life. The graded-density structure makes it possible to remove large particles and colloidal elements via the filter medium's external layer, which is more open, while smaller particles are retained in the filter's narrower internal zones.

This structure enables the contaminants to be distributed throughout the whole depth of the filter, thereby minimizing the pressure drop and maximizing the retention capacity.

Extended service life and superior quality.

LifeASSURE BLA series filter cartridges are designed to provide long service lives and high-performance levels.

Benefits

- Increases the final filter's service life
- Reduces the frequency of final filter change-outs, thereby considerably cutting filtration costs
- Helps reduce the micro-organism content significantly



3M™ Betafine™ PBG Series Filters

Multi-layer polypropylene 3M™ Betafine™ PBG Series Filters feature Advanced Pleat Technology (APT) to capture contaminant throughout the filter media to maximize retention capacity and filter life.

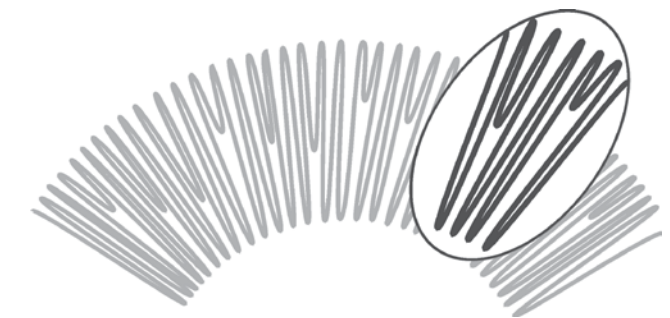


Benefits

- Consistent and reproducible retention of contaminants and protection of downstream membranes
- Reduction in total filtration operating costs, resulting from extended service life and reduced number of replacements
- Polypropylene construction makes it compatible with a range of chemical and temperature, such as high temperature sanitization

3M™ Betafine™ XL Series Filters

Polypropylene 3M™ Betafine™ XL Series Filters utilize APT, resulting in optimized filter media utilization and extended filter life.



Advanced Pleat Technology (APT)

3M™ LifeASSURE™ BA Series Filters and 3M™ LifeASSURE™ BNA Series Filters

Membrane filtration is the best method to use in order to achieve microbiological stability without using chemicals or heat. This ensures that the organoleptic properties of the wine are preserved until opening the product, whether this occurs weeks, months or years after bottling.

3M™ LifeASSURE™ BA (Nylon 6,6 membrane) and 3M™ LifeASSURE™ BNA (PES, highly asymmetric membrane) Series cartridges are available with retention grades of 0.65 µm in order to eliminate yeast, mould and bacteria, and 0.45 µm for removal of smaller micro-organisms responsible for spoiling wine. These technologies offer a greater capacity for holding contaminants and less resistance to flow, all resulting in a lower pressure drop compared to conventional membranes.



Extended Service Life

Resistant to steam and chemical cleaning, 3M™ LifeASSURE™ BNA Series Filters cartridges offer a long service life. Service life is measured in terms of “volume filtered” and “number of operating days before exhaustion”. Filters which offer longer service lives not only reduce direct operational costs, but also reduce indirect filtration costs for tasks, such as filter change-out/installation, machine downtime and regeneration.



3M™ LifeASSURE™ BA and 3M™ LifeASSURE™ BNA Series Filters

These cartridges provide thermal resistance permitting continuous service under demanding process conditions.

Benefits

- High surface area improves flow and filter life
- Spoilage organism retention provides reliable microbiological control
- Durable cartridge design withstands repeated hot water sanitation cycles
- Individually serialized and integrity tested in manufacturing — fully traceable



Bottle up with confidence.

Microporous membrane filtration is an excellent method of achieving microbiological stability in the container without the use of chemicals or heat. The organoleptic properties can be preserved until the product is opened — whether weeks or months after filling.

3M provides a cost-effective solution to achieve microbiological stability. By combining the economy of a depth filter, 3M™ Zeta Plus™ Series Filter, with the security of a membrane filter, 3M LifeASSURE BA Series Filters, 3M gives wine makers a complete sterile filtration package.

Water used in hot water sanitation in the winery must be filtered to the same degree as the wine.

Clean water is necessary in bottle washing, sanitation and cooling systems. Water that is free of particle and micro-organism contamination helps protect the integrity of a wine processing system and improves the service life of filters.

Hot Water Sanitation

Hot water sanitation is used to sanitize plumbing lines and wine filters.

Sanitation water filtration is essential to ensure downstream stability and to avoid contamination between process cycles.

Use of poorly filtered water to rinse or sanitize filters can result in early filter exhaustion.

3M™ Betapure™ NT-T Series Filters

3M™ Betapure™ NT-T Series filter cartridges are a 3M depth filtration technology designed to provide excellent service life while maintaining a consistent filtration efficiency. 3M Betapure NT-T Series filters achieve this through an innovative cartridge design that allows uniform distribution of fluid flow and contaminant throughout the entire depth of the cartridge.

Benefits

- Allows for broad chemical and temperature compatibility
- Long service life and consistent filtration efficiency resulting from flow enhancing filter media and an innovative flow pattern
- Polypropylene media allows for broad chemical and temperature compatibility
- Absolute rated performance provides consistent filtration quality
- Exhibits superior particle retention under increasing differential pressure



Product Selection and Use:

Many factors beyond 3M's control and uniquely within user's knowledge and control can affect the use and performance of a 3M product in a particular application. As a result, customer is solely responsible for evaluating the product and determining whether it is appropriate and suitable for customer's application, including conducting a workplace hazard assessment and reviewing all applicable regulations and standards (e.g., OSHA, ANSI, etc.). Failure to properly evaluate, select, and use a 3M product and appropriate safety products, or to meet all applicable safety regulations, may result in injury, sickness, death, and/or harm to property.

Warranty, Limited Remedy, and Disclaimer:

Unless a different warranty is expressly identified on the applicable 3M product literature or packaging (in which case such express warranty governs), 3M warrants that each 3M product meets the applicable 3M product specification at the time 3M ships the product. 3M MAKES NO OTHER WARRANTIES OR CONDITIONS, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR CONDITION OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ARISING OUT OF A COURSE OF DEALING, CUSTOM, OR USAGE OF TRADE. If a 3M product does not conform to this warranty, then the sole and exclusive remedy is, at 3M's option, replacement of the 3M product or refund of the purchase price.

Limitation of Liability:

Except for the limited remedy stated above, and except to the extent prohibited by law, 3M will not be liable for any loss or damage arising from or related to the 3M product, whether direct, indirect, special, incidental, or consequential (including, but not limited to, lost profits or business opportunity), regardless of the legal or equitable theory asserted, including, but not limited to, warranty, contract, negligence, or strict liability.



3M Separation and Purification Sciences Division
3M Canada
P.O. Box 5757
London, Ontario N6A 4T1

Phone 1-800-364-3577
Web 3M.ca/FoodandBeverage

**For more information about 3M filtration solutions
for wine production, please visit our website at:**

3M.ca/FoodandBeverage

3M, 3M Science. Applied to Life., Betafine, Betapure, Clean-Trace, LifeASSURE, Liqui-Cel, Liqui-Flux and Zeta Plus are trademarks of 3M. Used under license in Canada.
© 2023, 3M. All rights reserved. 2302-25695 E