Wine Filtration
Selection guide for products and applications
Parker domnick hunter has a continuous policy of product development and although the Company reserves the right to change specification, it attempts to keep customers informed of any alterations. This publication is for general information only and customers are requested to contact our Process Filtration Sales Department for detailed information and advice on a product’s suitability for specific applications. All products are sold subject to the company’s Standard conditions of sale.
Introduction
Ensuring total process control for consistent quality

Old and new world producers of wine have partnered with Parker domnick hunter for over 30 years to ensure their process and quality needs are achieved.

A proven product range combined with knowledgeable specialists of the wine making process enables Parker domnick hunter to provide value added solutions that guarantee quality.

Parker domnick hunter aims to provide local application specialists focused on providing added value solutions to wine makers and contract packagers. The local team supported by innovative products, state-of-the-art manufacturing facilities and internationally specialised support teams are all aimed at providing solutions which match Parker domnick hunter’s capabilities with the business needs of the producer. By providing added value solutions, Parker domnick hunter give producers greater control of their process, which lead to increased quality of their wines.

This is achieved through a structured pre and after sales program called Purecare. The Purecare approach by Parker domnick hunter looks at all aspects of the process, aimed at increasing overall process efficiency and product consistency whilst protecting the unique quality of the finished product.

Using upfront detailed technical assessments and structured after-sales support packages, Purecare ensures Parker domnick hunter solutions meet agreed performance criteria and that they continue to operate at maximum efficiency.

Parker domnick hunter products and solutions have been specifically developed to provide the required quality at every stage of the wine making process, whilst protecting the unique characteristics of wine, increasing process efficiency and giving producers and bottlers greater control throughout their process.

Consultation → Assessment → Review and Plan → Implementation
Typical processes

Sparkling Wines
- Dégorgement
- Bottling
- Secondary fermentation

Fine Wines
- Tanker Loading
- Bottling
- Maturation
- Physical Stabilisation
- Fermentation

Short Term Consumption
- Packaging

Final stabilization
- CO₂

Pre-stabilization
- N₂

Clarification
- N₂

Sterilization of gas
- CO₂

Water utilities
- Water

Gas utilities
- Steam

Chilling
- Sheet Filters
- Compressed Air
- N₂

Parker domnick hunter specialized wine applications

1. Final stabilization
2. Pre-stabilization
3. Clarification
4. Sterilization of gas
5. Water utilities
6. Gas utilities
7. Chilling
Application 1. Final stabilization
Understanding the application

A number of factors influence the character and appeal of wine during its journey from the fermentation tank to the bottle, but in order to produce stable wine which protects and develops flavour once packaged, the presence of spoilage organisms has to be reduced or eliminated completely.

Typical spoilage organisms in bottled wine are species capable of growing in low pH and anaerobic conditions for example lactic acid bacteria and fermenting yeasts such as *Brettanomyces bruxellensis*. Spoilage organisms can ruin wine by causing off flavours and haze or cloudiness, with contamination from strongly fermenting yeasts causing bottle explosions.

Depending upon the type of the wine and the processes used during its production, the threat of microbial spoilage will vary. For example, relatively young wine with low tannin levels and high residual sugar may be subject to spoilage from low numbers of yeast / bacteria. Mature wines with high alcohol, tannin and low nutrients may be slightly more resistant, however, threats from microbial contamination still exist.

For red wines, membrane filtration down to 0.65µm is typically adequate to eliminate spoilage organisms, however, for white wines, 0.45µm is typically used. Filtration with a tighter membrane than is necessary will cause the filter to block quicker, resulting in an uneconomical process so care must be taken to use the correct grade for the conditions.

BEVPOR wine filters utilize an inert PES membrane which has been designed to protect the flavour and character of wine by providing validated retention to typical spoilage organisms, without impacting upon taste or colour profiles.

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Application 2. Pre-stabilization

Understanding the application

Membrane Protection
In order to return long service life and efficient use of the final filtration system, the suspended particle and microbial loading of the wine should be reduced with adequate prefiltration. Final membrane filtration is normally the most expensive filter stage in the line and therefore, should only be used to remove microbes.

Fine Wine Polish
Mature or fortified wine is already physically, chemically and microbiologically stable and only requires a final polish to improve clarity and to remove any yeast and bacteria which may be present.

Standardization: Tank Transfer and Cellar Management
In order to protect wine quality during storage or transportation, yeast and other microbial loadings should be reduced.

The PREPOR range of filters have been developed to excel in the previous applications, with the new PREPOR NG filter designed to offer the optimum choice for increased microbial security, fine particle retention and the strength necessary to withstand repeated cleaning and backwash regeneration.

Membrane protection
fine wine polish
standardization

Pre-stabilization

Key filter requirements
• Removal of undesirable colloids
• Microbial reduction
• Stable construction for reliable retention
• Strength to withstand CIP
• High flowing

PREPOR PP
PREPOR NG

• Yeast reduction
• More retentive, advanced depth construction
• Yeast removal
• Bacterial reduction
• CIP regenerable
• Optimum choice for retention/lifetime

Size guide
10 l/min/10" cartridge
6hl/h/10" cartridge

See page 15 for rating guide
Application 3. Clarification

Understanding the application

**Trap filtration**
The trap filter system is designed to capture any solid particulate such as filter aids which may remain in the wine following primary clarification. The objective of this stage is to provide a consistent level of particulate filtration to help reduce filterability index and provide clear wine to intermediate storage.

**Crystal Removal**
Potassium bitartrate and calcium tartrate crystals are naturally occurring precipitates in wine which form non-hazardous, glass-like crystals as the alcohol concentration increases during must fermentation. These crystals are undesirable as they are sometimes large enough to be visible to the naked eye (>40µm) and need to be removed during production. To remove the crystals, the wine is chilled to just above freezing point, facilitating crystallization and precipitation, and the crystals can then be removed by filtration.

Parker domnick hunter has designed the PEPLYN TF as the optimum solution for maximum efficiency in crystal removal and trap filtration applications. The filters have been specially designed to capture particles on the surface of the media so that they can be easily removed through backwash, therefore allowing easy regeneration and long service lifetimes. The high area filter media will return high wine flow, whilst providing an absolute retention to solid particulate.

PEPLYN HD filters provide an optional solution to trap filtration and crystal removal applications where backwash regeneration is not feasible.

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**Key filter requirements**
- Ability to capture all DE powder - absolute rated
- High flow rated
- Highly robust for chemical / physical regeneration

**PEPLYN HD**
- High depth
- Ability to withstand blockage under variable particle loading

**PEPLYN TF**
- High surface area
- Specifically designed for backwash regeneration
- Optimum solution for clarification

Size guide
- 10-15 L/min/10¨cartridge
- 6-9hl/h/10¨cartridge

See page 15 for rating guide
Application 4. Sterilization of gases

Understanding the application

Compressed gases which come into direct contact with; ingredients, the finished product, packaging materials, storage vessels or the manufacturing machinery, are termed critical and require sterile filtration to safeguard against a potential contamination of the wine.

For aseptic filling operations, maintenance of machine sterility and the associated packaging such as bottles and caps becomes critically important. The filling machine will typically require at least one sterile gas filter to remove microorganisms from the nitrogen, CO₂ or compressed air used in the filling operation.

Key filter requirements
- Fully validated microbial retention
- Integrity testable
- Hydrophobic to prevent blinding with moisture
- High flowing to reduce operational costs and increase energy efficiency

For sizing consult your Parker domeck hunter representative or sizing calculator
Application 5. Water utilities

Understanding the application

Service water

Point of entry clarification

Cork and barrel washing

RO membrane

CIP makeup

Blending must and sugar

Bottle washing

Process water

PELYN PLUS
- Absolute retention for a range of micron grades
- Pleated polypropylene

PARMAX / MAXGUARD
- Large diameter
- Bulk water treatment

CARBOFLOW MX
- De-chlorination

PELYN PLUS
- Absolute retention for a range of micron grades
- Pleated polypropylene

PARMAX / MAXGUARD
- Large diameter
- Bulk water treatment

PELYN PLUS
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PELYN PLUS
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BEVPOR WG
- Validated microbial removal against waterborne bacteria
- Integrity testable

BEVPOR PS
- Validated microbial removal against waterborne bacteria

BEVPOR WG
- Validated microbial removal against waterborne bacteria

BEVPOR MS
- Sterile filtration to protect the bottling process
- Integrity testable
Application 6. Gas utilities

Compressed air pretreatment / generation

- Product carbonation / filling
  - Compressed gas filter
  - Particle removal to 1 micron
  - Remaining oil content 0.5 ppm

- Nitrogen blanketing / flushing
  - Compressed gas filter
  - Particle removal to 0.01 micron
  - Remaining oil content 0.01 ppm

- Purging
  - Hydrophobic gas filter
  - Liquid and aerosol integrity testing
  - Hydrophobic glass microfibre

Production or process air / gas

- Product carbonation / filling
  - Ultra high efficiency gas filter
  - Particle removal to <0.01 micron
  - Remaining oil content 0.001 ppm

- Nitrogen blanketing / flushing
  - Oil vapour and odour removal
  - Air quality to ISO 8573.1: Class 1 od

- Purging
  - Hydrophobic membrane filter
  - Liquid and aerosol integrity testing

MAXIGAS
- Generates N₂ in-house, eliminating need to buy-in
- On demand, convenient and secure supply
- High purity supply
- Modular design allows expansion
- Cost-effective supply

Steam

No product contact

- Product carbon contact

- Culinary 3A standard 609-03

- Culinary 3A Standard 609-03
  - 95% retention of >2 micron particles in the liquid phase
  - Manufactured from 316 series stainless steel
  - Any additives to the boiler feed should conform to CFR Title 21, Chapter 1, Part 173, Section 173.310

- Steam
  - No product contact
  - Product contact

SINTERED
- 25 µm
- SINTERED 1 µm
- PLEATED 5 µm
- PLEATED JUMBO 1 µm

Culinary 3A Standard 609-03
- 150 - 280 Kg/hr
- 750 - 3750 Kg/hr

- ValAirData 3
- Purging
  - Venting top pressure

- Hydrophobic glass microfibre
  - Aerosol integrity test VALAIRDATA 3

- HC low microns
- 609-03
Application 7. Chilling
Creating the right environment

Process cooling is regularly used in the processing of wine:
- To regulate temperature during fermentation.
- During accelerated precipitation of tartrate crystals.
- To stabilize the wine during storage.

Parker domnick hunter Hiross has more than 30 years experience in the manufacture of industrial cooling systems. In recent years a wide range of chillers for the production of chilled water has been introduced. Coupled with a sales and engineering team capable of providing customized solutions to meet individual needs, this provides a dedicated approach to the requirements of winery applications.

The technology is characterized by a high refrigeration yield for low electrical consumption. Combined with a small footprint this leads to a compact, space-saving and energy efficient solution.

Chillers are available for internal and external installation and are equipped with microprocessor intelligence providing precise control and automatic function.
Product selection process wine

There is no one single solution to an oenologist’s filtration requirements. Depending on the region and international location, production methods vary significantly. It is therefore essential that a structured process for identifying efficient process filtration solutions is followed. The Purecare program outlines the required information prior to establishing a filtration solution and the assessment methods used to identify the suitability of any Parker domnick hunter solution.

The SELECT process builds on the principles used to select the optimum filtration solution for the end user. Starting with the end in mind following the outlined procedure will help to identify a suitable filtration solution.

- **What is the customer trying to achieve?**
  - Trap filtration
  - Wine polishing
  - Crystal removal
  - Tanker loading
  - Bag in box
  - Bottling

- **What grade of filter?**
  - Wine type
    - White and rose 0.45µm
    - Red 0.65µm
  - Retention efficiency
  - LRV / Titre
  - Field Data?
  - Integrity Testing required?

- **Life to blockage**
  - Identify volume throughput benchmark
  - Prefiltration
  - Wine quality
  - Flow rates
  - CIP / Regeneration procedures

- **Filter integrity**
  - Compatibility with process parameters
  - CIP / SIP / regeneration
  - Pressure pulsing / flow requirements
  - Temperature fluctuations

- **Existing housings**
- **Endcap configuration**
- **System size**
  - Capital costs vs operating costs
- **Operational efficiency**
  - Reduced maintenance
  - Reduced chemicals and water usage
- **Product and process safety**

- **Differentiation through support packages**
  - Purecare
    - Contract testing
    - Filter changeout
    - Operator training
    - Remote monitoring
    - Process audits
    - Returned filter analysis

- **Ongoing support benefits?**
  - Purecare
    - Operator training
    - Technical audits
    - Troubleshooting

- **Local emphasis**
- **High degree of divisional support**
Filter housings

**Air / gas housings**
- **Direct product contact**
  - High specification sanitary air / gas housing
  - Internal finish - 0.4 µm Ra
  - External finish - 0.8 µm Ra

- **Indirect product contact**
  - Sanitary air / gas
  - Choices of finish available

**Tank vents**
- Open vent housing
- Choices of finish available
- Closed tee port air / gas
- Choices of finish available

**Liquid housings**
- Sanitary liquid housing
  - Internal finish - 0.4 µm Ra
  - External finish - 0.25 µm Ra

- Liquid housing
  - Internal finish - As welded
  - External finish - 0.8 µm Ra
  - Electropolished option

- Sanitary multi-round housing range 3 - 30 round
  - Internal finish - 0.4 µm Ra
  - External finish - Mechanically polished

**Steam housings**
- Single, 3 and 5 round housings
  - Single, 3 and 5 round steam vessels
  - Horizontal or vertical orientation
  - Selection of ISO, JIS4604, DIN2633 and ANSI RF150 connection flanges

- Jumbo HIGH FLOW steam vessels
  - Internal finish - 0.8 µm Ra
  - 100% pickled & passivated
  - External finish - Grit blast 5 µm Ra

**Electropolished option**
- Mechanical polishing

**Single and multi style filter housings C Style**
- Single and multi large format filter housings (PARMAX)

**780-1300 Kg/hr**
- 62-280 Kg/hr

**HSA**
**HBA**
**HSV**
**HBA**
**HSL**
**HIL**
**VSH**
**HPM**
**VIS**
**HBA-HP**
Liquid filtration - Trap filtration and crystal removal

**PEPLYN HD**
5, 10, 15 micron  Polypropylene
- Graded density and increased depth resulting in high dirt holding capacity
- Ideally suited to high volume, forward flow processes

PEPLYN HD has been developed using graded pore density depth polypropylene media for clarification of wine. The PEPLYN HD has outstanding particulate holding capacity through its multi-layer depth construction providing optimized filtration for wine with high particulate loading and size distribution.

**PEPLYN TF**
5, 10, 15 micron  Polypropylene
- Graded density results in high dirt holding capacity
- Optimized pleat configuration maximizes backwash efficiency

PEPLYN TF filters have been specially designed to capture particles on the surface of the media so that they can be easily removed through backwash, therefore allowing easy regeneration and long service lifetimes. The high area filter media will return high wine flow, whilst providing an absolute retention to solid particulate.

Pre-stabilization - Tank transfer, fine wines, membrane protection and cellar management

**PREPOR NG**
0.5 - 1.0 micron  Polypropylene
- Validated yeast removal and bacterial reduction
- Graded density construction for increased retention and throughput
- Strong, pleated polypropylene construction for backwash and chemical CIP

Combining a superior level of microbial retention with a strong and robust construction to withstand frequent CIP and backwash, PREPOR NG filters represent the optimum choice for pre-stabilization applications such as membrane protection and tank transfer operations.

**PREPOR PP**
0.6 - 1.0 micron  Polypropylene
- Yeast and bacterial reduction
- Strong, pleated polypropylene construction for backwash and chemical CIP

PREPOR PP filter cartridges will significantly reduce the numbers of yeast and spoilage organisms from beverage products, to provide extremely cost effective microbial stabilization.

**PEPLYN HA**
1.0 – 20 micron  Polypropylene
- Absolute particle retention at a range of micron grades
- Strong, pleated polypropylene construction designed for chemical CIP

PEPLYN PLUS filters are utilized for the clarification and pre-stabilization of a wide range of liquids for the food and beverage industry.

Liquid filtration - Final stabilization

**BEVPOR PS**
0.45, 0.65 and 1.2 micron  Polyethersulphone
- Validated microbial retention for effective stabilization
- 0.6m² filtration area

BEVPOR PS filters have been validated against typical wine spoilage organisms. Combined with easy integrity testing, the filters ensure the effective microbial stabilization of wine. The advanced polyethersulphone membrane has been configured to provide high flow and cost effective performance throughout the range of grades.

**BEVPOR PW**
0.45, 0.65 and 1.2 micron  Polyethersulphone
- Validated microbial retention for effective stabilization
- 0.6m² filtration area
- Integral prefilter layer

BEVPOR PW filters have been validated against typical wine spoilage organisms. Combined with easy integrity testing, the filters ensure the effective microbial stabilization of wine. The advanced polyethersulphone membrane in conjunction with the integral prefilter layer provides extended service life to blockage and improved filtration economics.

**BEVPOR PH**
0.45, 0.65 and 1.2 micron  Polyethersulphone
- Validated microbial retention for effective stabilization
- High filtration area – 0.8m²
- Integral prefilter layer

BEVPOR PH filters have been validated against typical wine spoilage organisms. Combined with easy integrity testing, the filters ensure the effective microbial stabilization of wine. The advanced, high area polyethersulphone membrane in conjunction with the integral prefilter layer will provide maximum service life to blockage and the optimum solution for wine stabilization.
## Air / Gas filtration

<table>
<thead>
<tr>
<th>HIGH FLOW BIO-X</th>
<th>HIGH FLOW TETPOR II</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01 micron sterilising</td>
<td>0.01 – 0.2 micron</td>
</tr>
<tr>
<td>• 94% voids volume PTFE impregnated glass fibre</td>
<td>• Assured biosecurity with absolute rated filtration</td>
</tr>
<tr>
<td>• Exceptional flow rates with low pressure drops</td>
<td>• High flow rates with low pressure drops</td>
</tr>
<tr>
<td>• Integrity testable by aerosol challenge</td>
<td>• High voids volume PTFE membrane</td>
</tr>
<tr>
<td>HIGH FLOW BIO-X combines proven depth filter technology and a pleated construction to provide retention down to 0.01 micron in gas. Flow rates typically 2-3 times that of membrane filters make HIGH FLOW BIO-X the filter that can dramatically reduce cartridge usage and installation size within the fermentation, food and beverage industries.</td>
<td>HIGH FLOW TETPOR II sterilisation filter cartridges offer exceptional filtration performance whilst providing the highest levels of biosecurity throughout the process industry. Operating at ambient temperature conditions, HIGH FLOW TETPOR II filter cartridges provide a cost-effective filtration solution.</td>
</tr>
</tbody>
</table>

## Water treatment

<table>
<thead>
<tr>
<th>PROPLEAT</th>
<th>PARMAX</th>
<th>PEPLYN PLUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0 – 10 micron</td>
<td>1 – 20 microns</td>
<td>0.6 – 25 micron</td>
</tr>
<tr>
<td>• Economical solution to particle removal</td>
<td>• Large diameter filtration for high flow rates and high capacity</td>
<td>• Absolute particle retention at a range of micron grades</td>
</tr>
<tr>
<td>PROPLEAT filters have been developed to bridge the gap between meltblown depth filters and absolute pleated media filters. The all polypropylene construction exhibit 99% efficiency at their given retention rating, providing consistent and economical clarification in a diverse range of applications.</td>
<td>• Absolute retention ratings for critical filtration</td>
<td>• Strong, pleated polypropylene construction designed for chemical CIP</td>
</tr>
<tr>
<td>PARMAX filters offer the optimum solution to bulk water treatment where costs of equipment space are at a high premium. The use of PARMAX large diameter cartridge and housing offers a smaller footprint which is advantageous. The cartridges are available in absolute micron ratings from 1 to 20 microns.</td>
<td></td>
<td>PEPLYN PLUS filters are utilized for the clarification and pre-stabilization of a wide range of liquids for the food and beverage industry.</td>
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<th>BEVPOR WG</th>
<th>BEVPOR MS</th>
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<tr>
<td>0.2 micron</td>
<td>0.2 micron</td>
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<tr>
<td>• Validated microbial removal against water borne bacteria</td>
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<tr>
<td>BEVPOR WG filters utilize a pleated PES membrane to remove bacterial contamination from water, ensuring the water supply entering the facility is of a safe standard to reduce the risk of biofilm formation / product spoilage.</td>
<td>• Integrity testable</td>
</tr>
<tr>
<td>BEVPOR MS filters utilize a pleated PES membrane to remove bacterial contamination from water, ensuring the water supply entering the facility is of a safe standard to reduce the risk of biofilm formation / product spoilage. Added security is ensured through ease of repeat integrity testing.</td>
<td></td>
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Housings

**HSA**
- Flow-efficient sanitary range of air / gas housing
- Designed specifically for the food and beverage industry
- Sanitary tri-clamp, vent and drain connections as standard
- Sanitary tri-clamp body closure as standard

**HBA**
- Flow-efficient range of air / gas housing
- Designed to maximise flow and minimise pressure drop
- Designed specifically for the food and beverage industry

**HSV**
- Industrial vent housing
- Direct connection to tank boss allows housing to be self supported
- Corrosion resistant 316L stainless steel
- Easy assembly and maintenance

**HSL**
- Single-element sanitary liquid housing
- Designed specifically for the food and beverage industry
- Sanitary vent, tri-clamp connections as standard
- Sanitary tri-clamp body closure as standard

**HIL**
- Industrial single-element liquid housing
- BSPP inlet / outlet standard connections
- Suitable replacement for plastic housings
- Suitable for cartridge types DOE or 222 and 226

**VSH**
- Multi-element sanitary liquid housing
- Designed specifically for the food and beverage industry
- High quality crevice free construction
- Available for 3 to 30 round filters

**VIS**
- High efficiency steam filter housing
- Compatible with JUMBO element to maximise steam capacity

**HBAHP**
- Air / gas and steam housing
- For pressures up to 15 barg (220.81 psig) @ 205 °C (401 °F)
- Double bolted clamp for extra security
- Available with many connection types

**HSL**
- Flow efficient range of air / gas housing

**HIL**
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Integrity testing equipment

**VALAIRDATA 3**
- Aerosol challenge testing
- Integrity testing of gas filters

**BEVCHECK**
- Pressure decay and diffusional flow testing
- Hand held portability with rechargeable battery option
- Flexible: suitable for use with compressed air or nitrogen

**BEVCHECK PLUS**
- Pressure decay and diffusional flow testing
- Convenient built-in printer provides printed test report
- Flexible: suitable for use with compressed air or nitrogen

Compressed air pre-treatment

**OIL-X**
- The most energy efficient filters available
- High quality ISO8573.1:2001 compressed air
- Running costs that start low and stay low

**PCO₂**
- Ensures compliance with quality guidelines published by the International Society for Beverage Technologies (ISBT)
- Protects drinks manufacturing processes from vapour impurities

**MAXIGAS**
- Low life-cycle ownership cost and elimination of costs associated with a cylinder supply
- On-demand functionality limits waste
- Energy efficient: operates from a small compressor