



Wine Filtration

Training guide for products and applications

aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding



ENGINEERING YOUR SUCCESS.

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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.

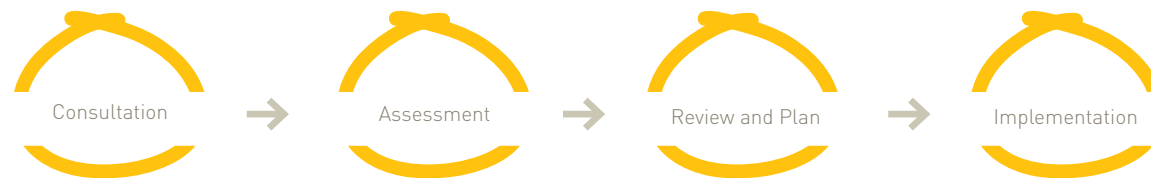
Parker domnick hunter aims to provide local application specialists focused on providing added value solutions to wine makers and contract packagers. The local team supported by innovative products, state-of-the-art manufacturing facilities and internationally specialised support teams are

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.

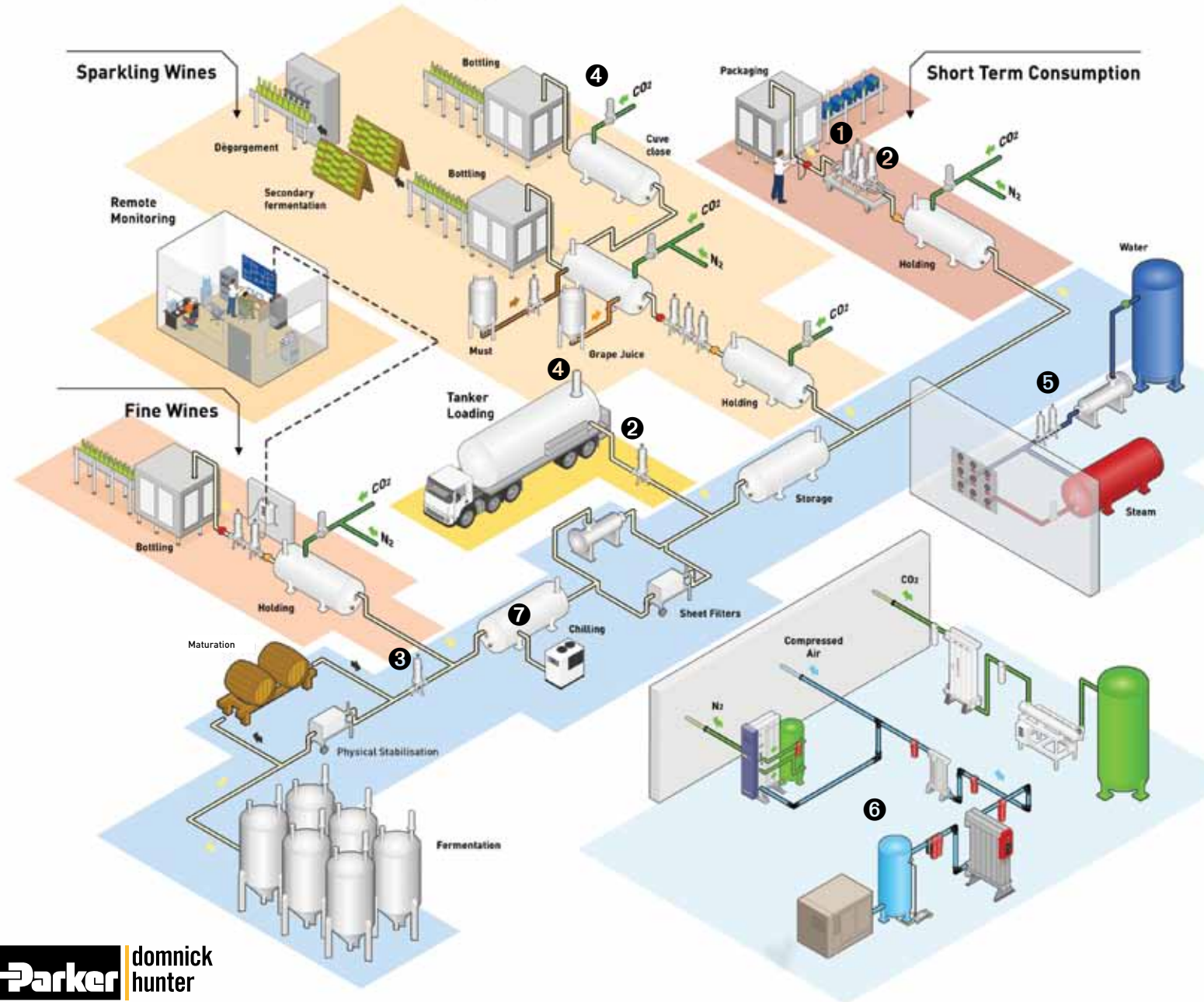
This is achieved through a structured pre and after sales program called Purecare. The Purecare approach by Parker domnick hunter looks at all aspects of the process, aimed at increasing overall process efficiency and product consistency whilst protecting the unique quality of the finished product.

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.



Typical processes



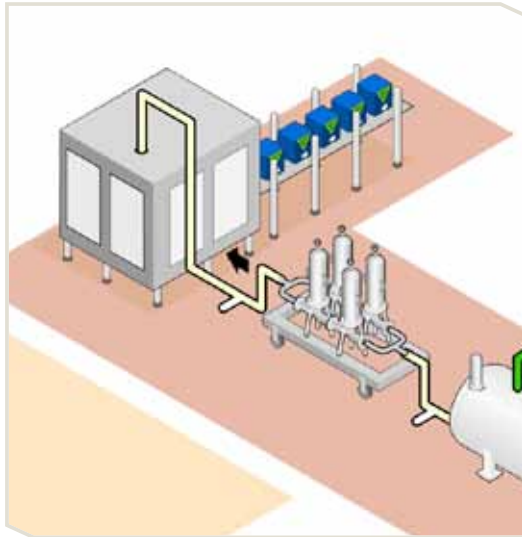
Parker domnick hunter specialized wine applications

- 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



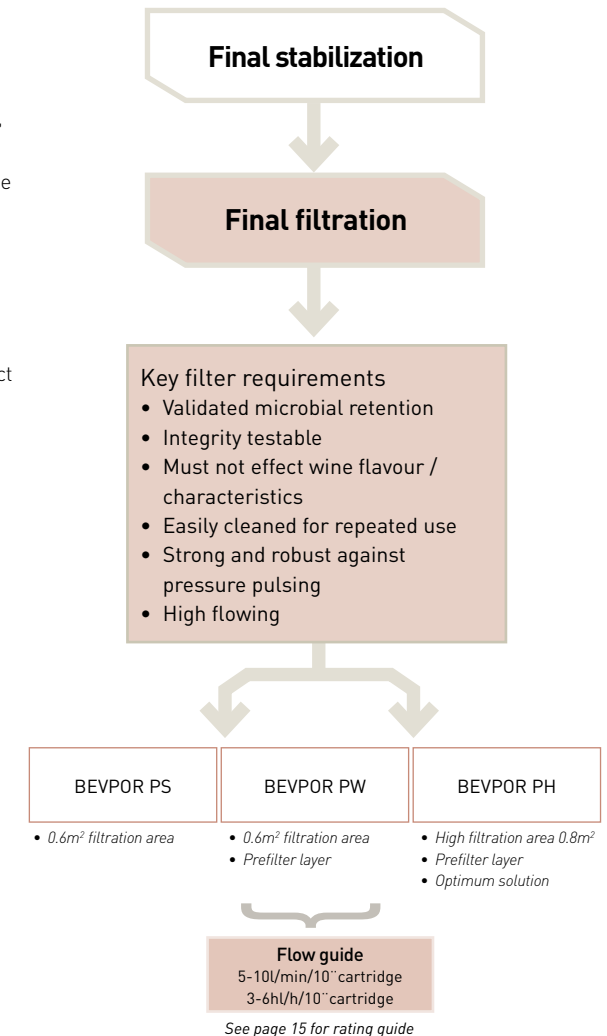
A number of factors influence the character and appeal of wine during its journey from the fermentation tank to the bottle, but in order to produce stable wine which protects and develops flavour once packaged, the presence of spoilage organisms has to be reduced or eliminated completely.

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.

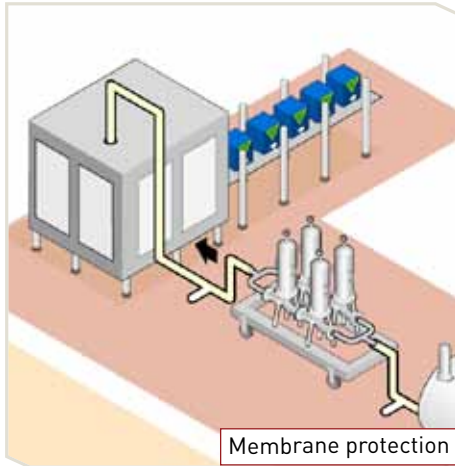
For red wines, membrane filtration down to 0.65µm is typically adequate to eliminate spoilage organisms, however, for white wines, 0.45µm is typically used. Filtration with a tighter membrane than is necessary will cause the filter to block quicker, resulting in an uneconomical process so care must be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



Application 2. Pre-stabilization

Understanding the application

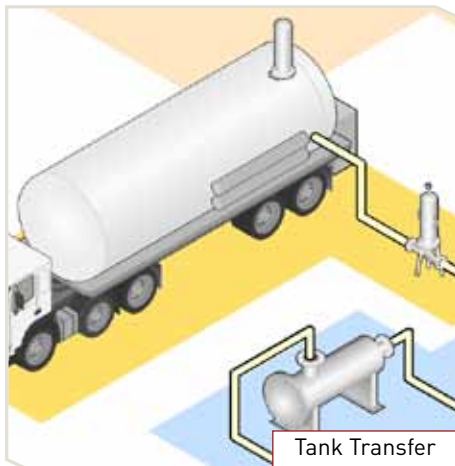


Membrane Protection

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

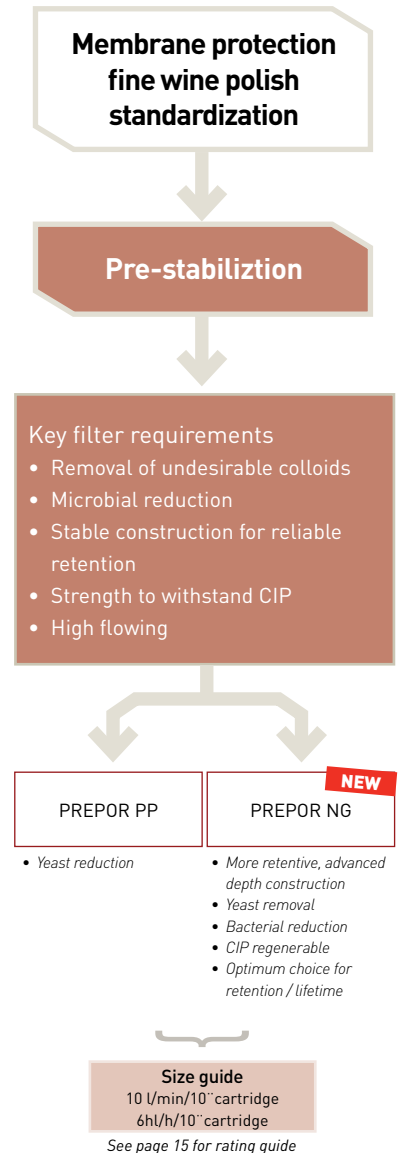
Mature or fortified wine is already physically, chemically and microbiologically stable and only requires a final polish to improve clarity and to remove any yeast and bacteria which may be present.



Standardization: Tank Transfer and Cellar Management

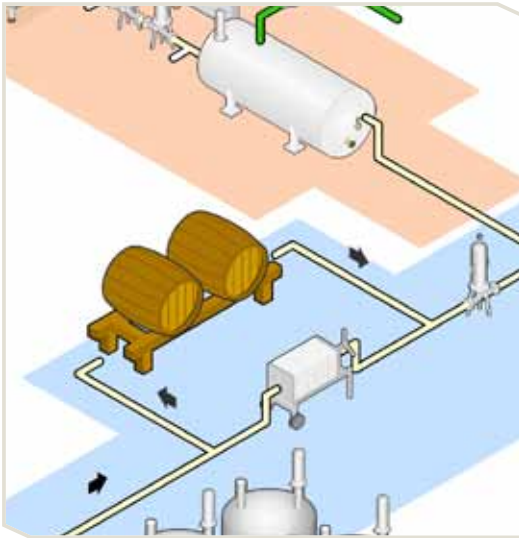
In order to protect wine quality during storage or transportation, yeast and other microbial loadings should be reduced.

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.



Application 3. Clarification

Understanding the application



Trap filtration

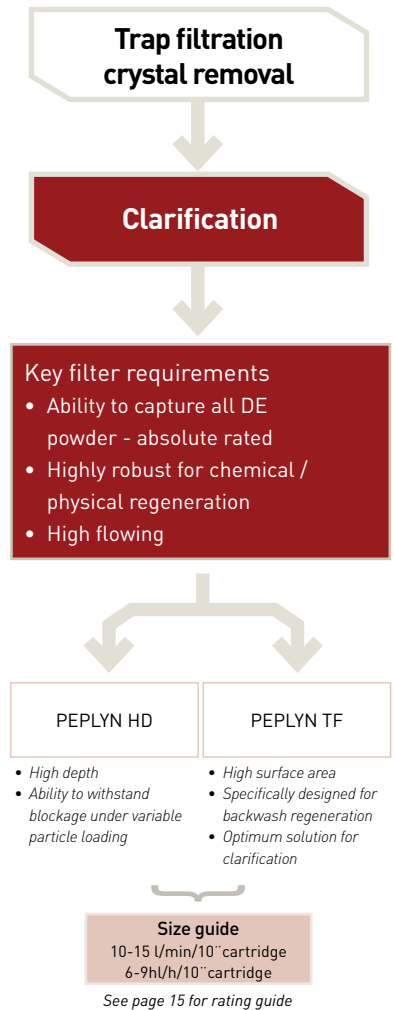
The trap filter system is designed to capture any solid particulate such as filter aids which may remain in the wine following primary clarification. The objective of this stage is to provide a consistent level of particulate filtration to help reduce filterability index and provide clear wine to intermediate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

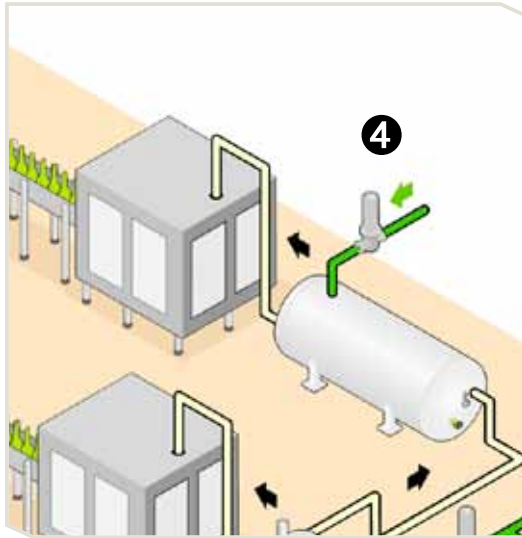
Parker domnick hunter has designed the PEPLYN TF as the optimum solution for maximum efficiency in crystal removal and trap filtration applications. The filters have been specially designed to capture particles on the surface of the media so that they can be easily removed through backwash, therefore 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.



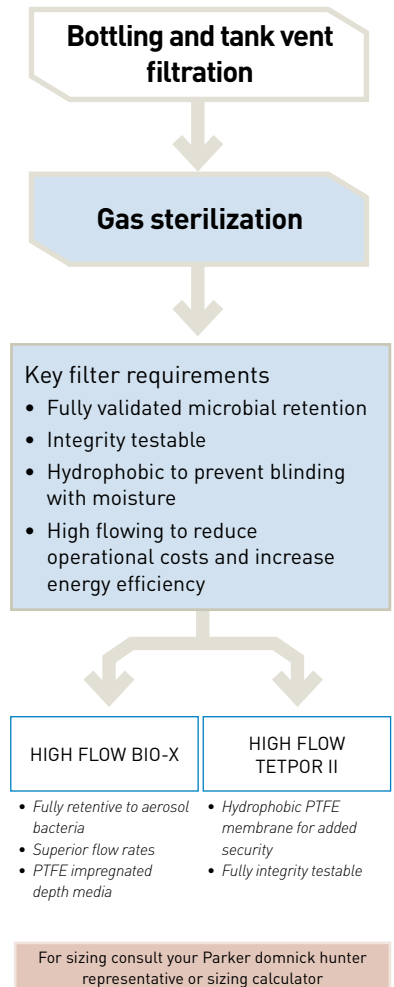
Application 4. Sterilization of gases

Understanding the application



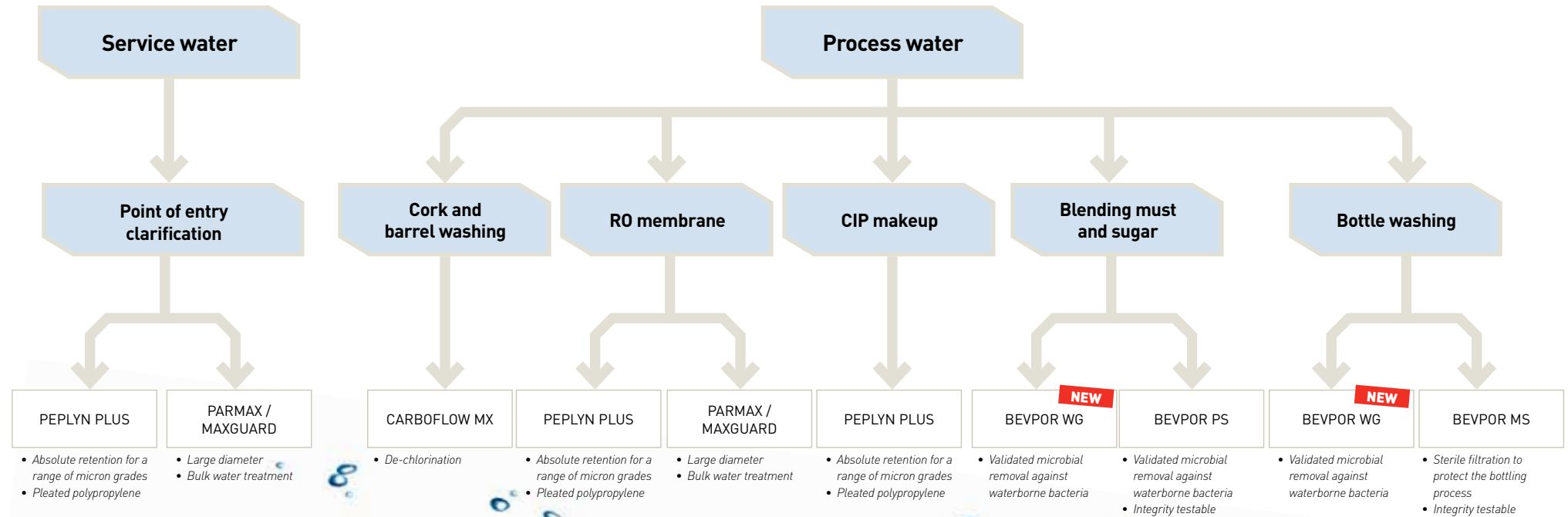
Compressed gases which come into direct contact with; ingredients, the finished product, packaging materials, storage vessels or the manufacturing machinery, are termed critical and require sterile filtration to safeguard against a potential contamination of the wine.

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.

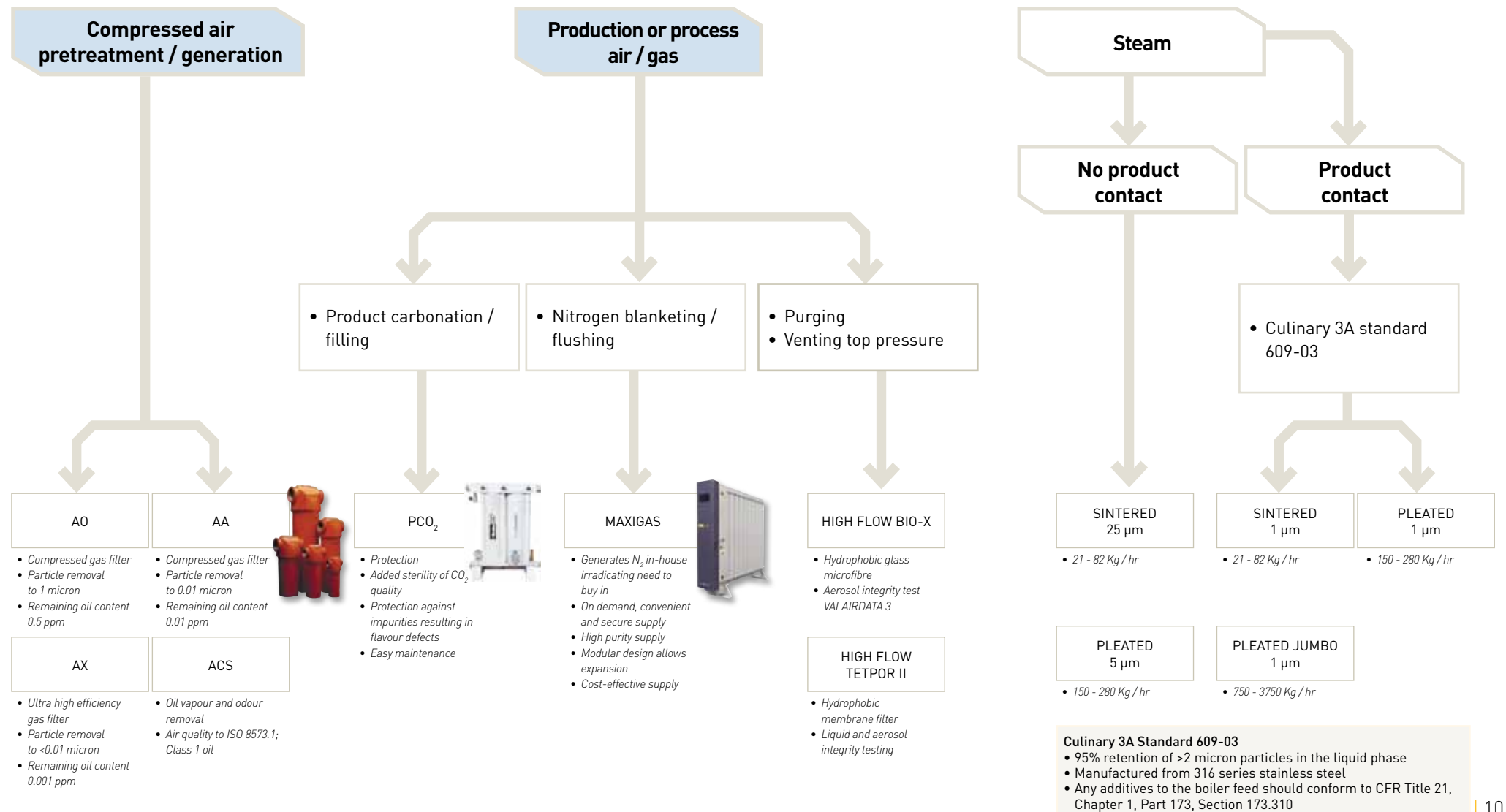


Application 5. Water utilities

Understanding the application



Application 6. Gas utilities



Application 7. Chilling

Creating the right environment

Process cooling is regularly used in the processing of wine:

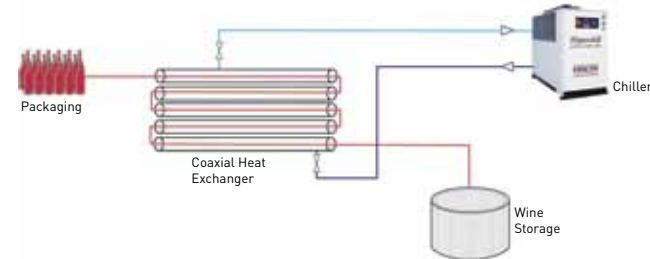
- To regulate temperature during fermentation.
- During accelerated precipitation of tartrate crystals.
- To stabilize the wine during storage.

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.

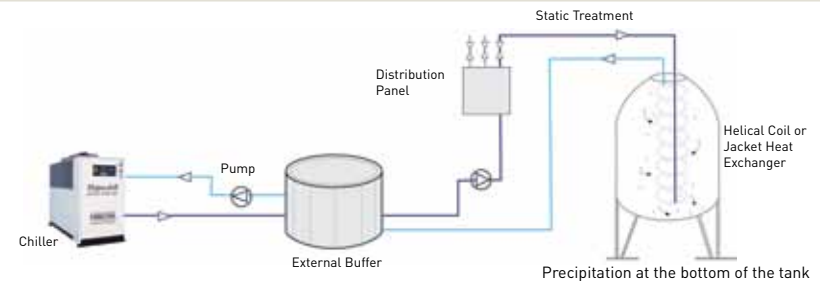
The technology is characterized by a high refrigeration yield for low electrical consumption. Combined with a small footprint this leads to a compact, space-saving and energy efficient solution.

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

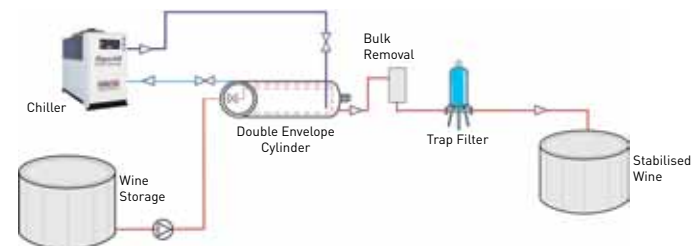
In-Line Chilling



Tank Chilling



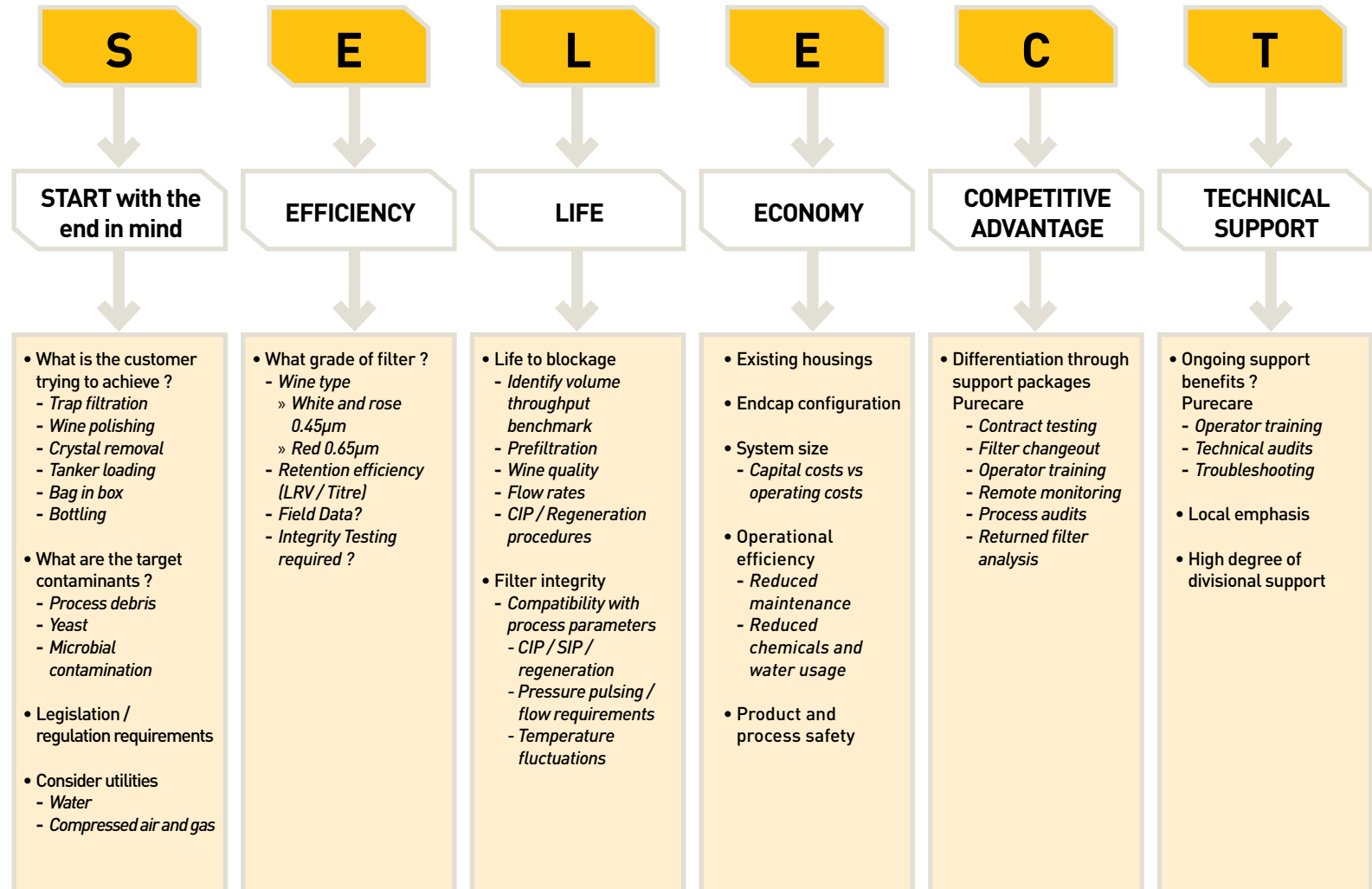
Tartrate Precipitation



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.

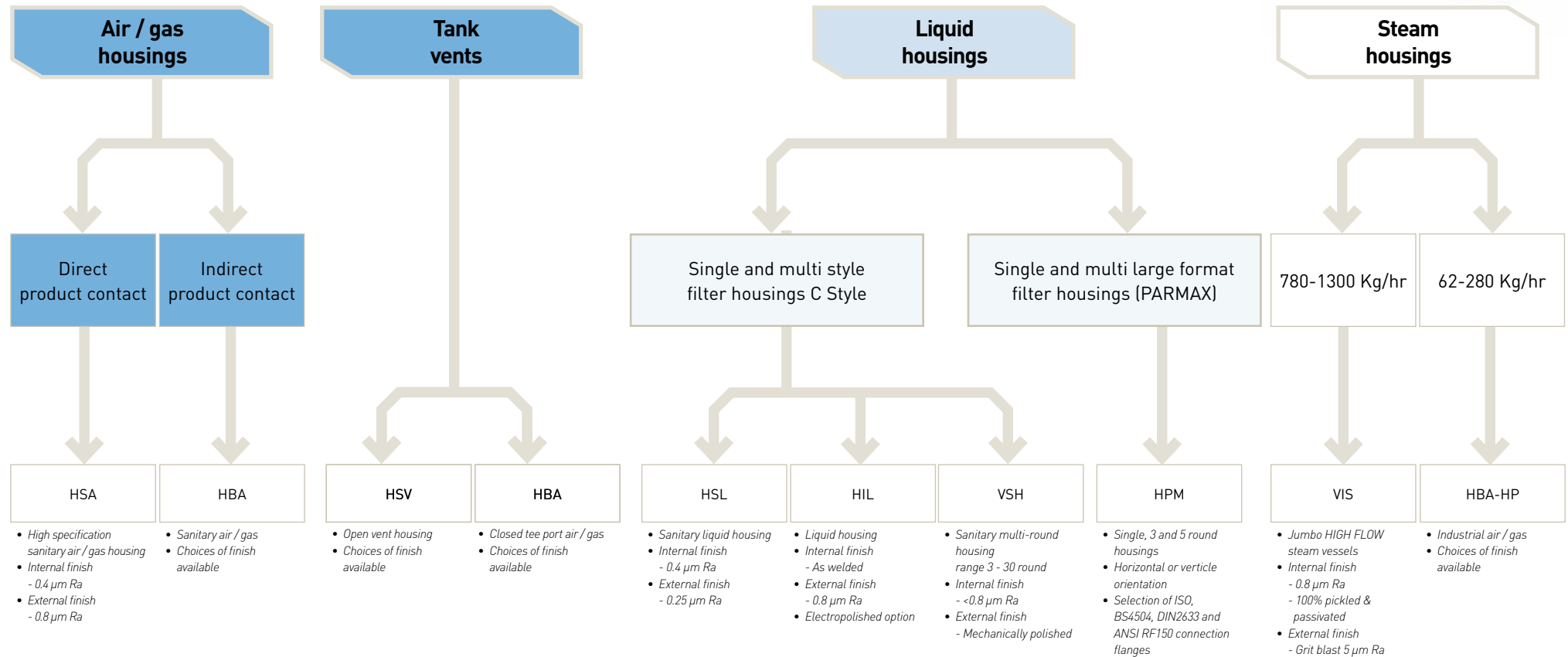


Selection matrix



	PARMAX / MAXGUARD	PROPLEAT	PEPLYN PLUS	CARBOFLOW MX	PEPLYN HD	PEPLYN TF	PEPLYN HA	PREPOR PP	PREPOR NG	BEVPOR PS	BEVPOR PW	BEVPOR PH	BEVPOR MS	BEVPOR WG	HIGH FLOW BIO-X	HIGH FLOW TETPOR II
Water Treatment	Point of entry clarification	1	3	2												
	Dechlorination	P	P		1											
	RO membrane protection	P	2	1												
	Bottle washing			P									1	2		
Clarification	Trap filtration				2	1										
	Crystal removal				2	1										
Pre-stabilization	Membrane protection						P	2	1							
	Fine wine polish / tank transfer							2	1							
Final Stabilization	Final filtration						P		P	3	2	1				
Gas Sterilization	Tank venting														2	1
	Nitrogen blanketing														2	1

Filter housings



Liquid filtration - Trap filtration and crystal removal

PEPLYN HD



Polypropylene

5, 10, 15 micron

- 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



Polypropylene

5,10 15 micron

- 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



Polypropylene

0.5 - 1.0

- 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



Polypropylene

0.6 - 1.0 micron

- 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



Polypropylene

1.0 - 20 micron

- 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



Polyethersulphone

0.45, 0.65 and 1.2 micron

- 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



Polyethersulphone

0.45, 0.65 and 1.2 micron

- 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



Polyethersulphone

0.45, 0.65 and 1.2 micron

- 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

HIGH FLOW BIO-X



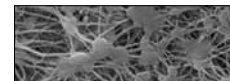
0.01 micron sterilising

PTFE Impregnated Glass Fibre

- 94% voids volume PTFE impregnated glass fibre
- Exceptional flow rates with low pressure drops
- Integrity testable by aerosol challenge

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.

HIGH FLOW TETPOR II



0.01 - 0.2 micron

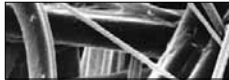
Polypropylene Expanded PTFE

- Assured biosecurity with absolute rated filtration
- High flow rates with low pressure drops
- High voids volume PTFE membrane

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.

Water treatment

PROPLEAT



1.0 – 10 micron

Polypropylene

- Economical solution to particle removal

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.

PARMAX



1 – 20 microns

Polypropylene

- Large diameter filtration for high flow rates and high capacity
- Absolute retention ratings for critical filtration

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.

PEPLYN PLUS



0.6 – 25 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.

BEVPOR WG



0.2 micron

Polyethersulphone

- Validated microbial removal against water borne bacteria

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.

BEVPOR MS



0.2 micron

Polyethersulphone

- Validated microbial removal against water borne bacteria
- Integrity testable

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.

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 (232.06 psig) @ 205 °C (401 °F)
- Double bolted clamp for extra security
- Available with many connection types



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



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