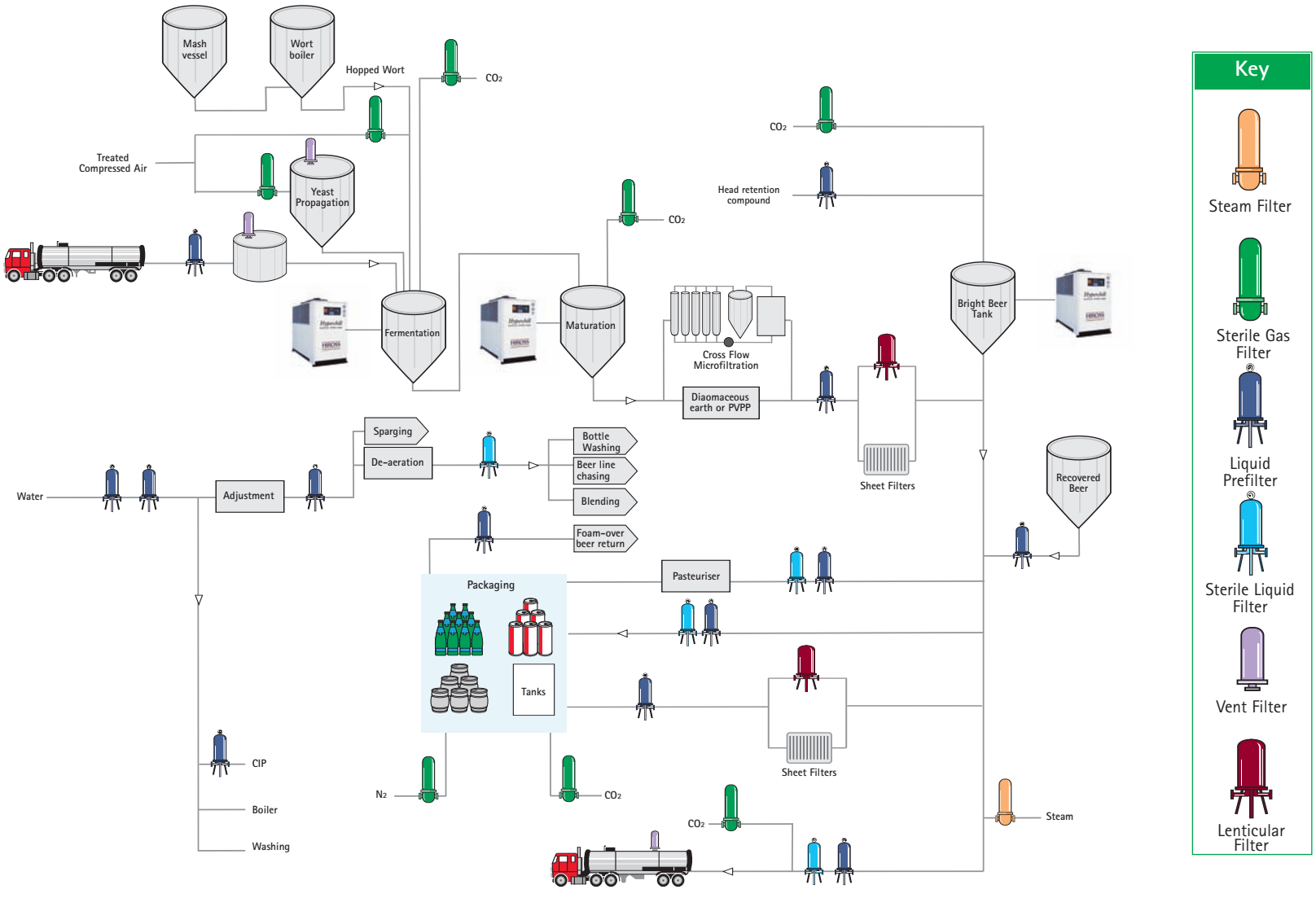
# Brewing Capability

Parker

dh
domnick hunter

# Typical Brewing Process



## Also available from Parker domnick hunter


- Complete Process Filtration Range
- Process Filter Datasheets
- Full Range of Process Housings
- Integrity Testing Equipment


- Parker domnick hunter Technologies Complete Product Range
- Process Filter Datasheets
- Full Range of Process Housings
- Integrity Testing Equipment


- Full TSG Capability
- Dedicated Support Team
- Contract Support
- Technical Analysis

For more information please contact:

0191 410 5121

dhprocess@parker.com

www.domnickhunter.com

# contents


CUSTOMER FOCUSSED
Continued Investment in Manufacturing
State of the Art Laboratory Facility
Custom Fabrication Facility
Membrane Manufacturing
Dedicated Technical Support
Sterile Liquid and Gas Filtration
Integrity Testing Equipment
Global Support

# Process Operations

## ....providing complete filtration solutions

**Parker domnick hunter** specialises in the manufacture and supply of high quality products for the clarification, stabilisation and sterilisation of liquids and gases, providing full scaleability from membrane flat stock discs to multi-element filter systems. Each filter range has been specifically developed for industry requirements.

We have a vast range of filtration experience enabling us to provide innovative and cost effective solutions for all your filtration requirements.

**Parker domnick hunter's** commitment to service is reflected in our comprehensive before and after sales service.

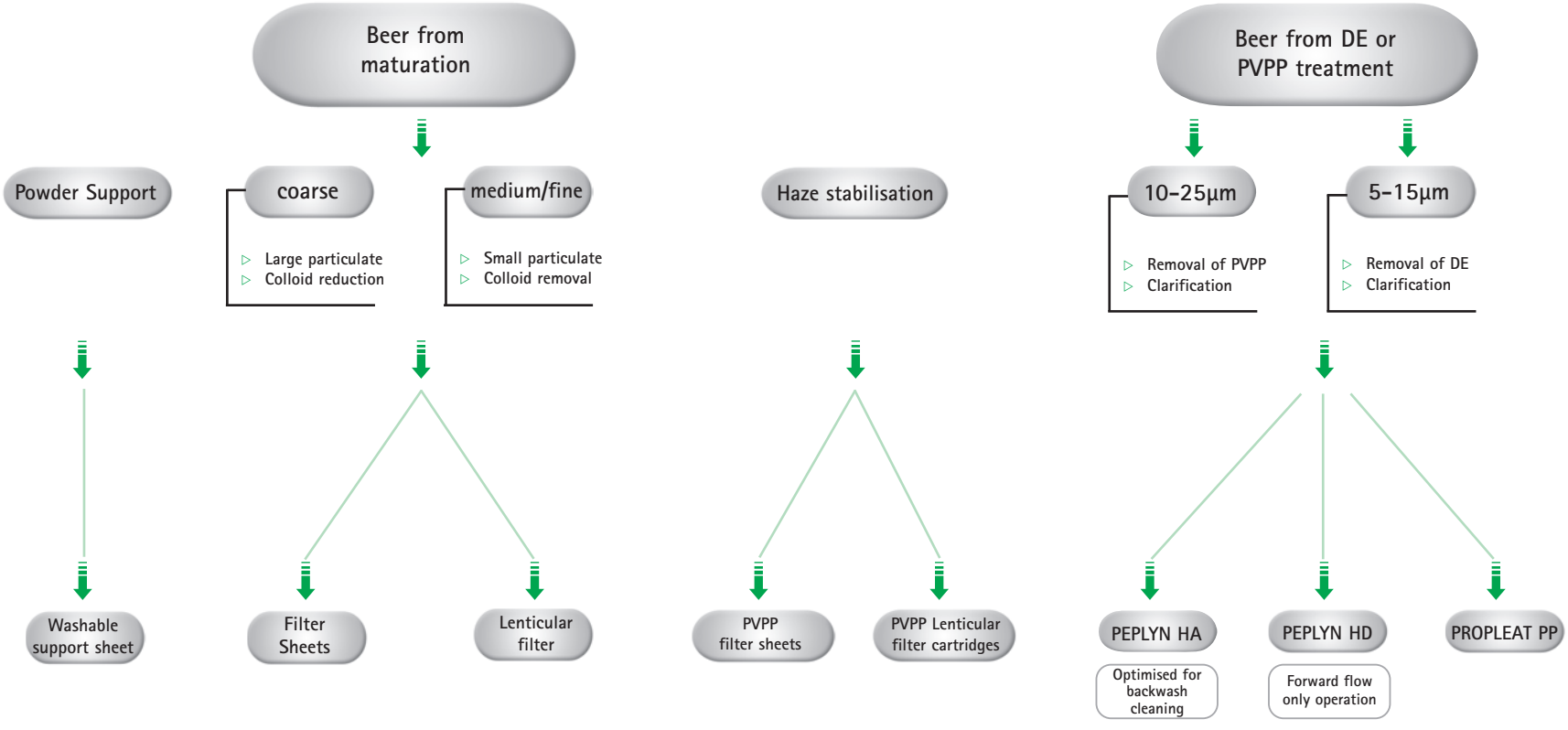
Our worldwide assistance extends to on-site evaluations, design, manufacture, validation, quality control and ongoing support long after the filters are installed.

We supply the best products for you, when and where you need them.

In 2005 **domnick hunter**, became part of the Parker Hannifin Corporation, with annual sales exceeding $10 billion, Parker Hannifin is the world's leading diversified manufacturer of motion and control technologies and systems.

We have a vast range of filtration experience enabling us to provide cost effective solutions for all your filtration requirements. We have the capability to work across application areas including:

- Biopharmaceutical
- Beverage
- Chemical
- Electronics
- Fermentation
- Food and Dairy
- Healthcare and Cosmetics
- Hospitals
- Paints and Inks
- Petrochemical


Beer from maturation
Powder Support
coarse
medium/fine
Large particulate
Colloid reduction
Small particulate
Colloid removal
Haze stabilisation
Beer from DE or PVPP treatment
10-25µm
5-15µm
Removal of PVPP
Clarification
Removal of DE
Clarification
Washable support sheet
Filter Sheets
Lenticular filter
PVPP filter sheets
PVPP Lenticular filter cartridges
PEPLYN HA
PEPLYN HD
PROPLEAT PP
Optimised for backwash cleaning
Forward flow only operation

# Physical Stabilisation

## ensuring haze-free, longer lasting beer

Stabilisation of beer is not a discrete operation. It is a gradual progression of procedures aimed at optimising the removal of undesirable content at each stage of production. In dealing with physical, chemical and microbiological stability, the selection of raw materials and the design of the brewing processes play a large role in ensuring final product quality.

Physical stabilisation is the process of preventing hazes and deposits from forming after the beer has been packaged. This can be achieved by removing constituents that will eventually lead to haze formation, such as certain proteins and polyphenols, or by accelerating the formation of hazes and deposits so that they can be removed prior to packaging.

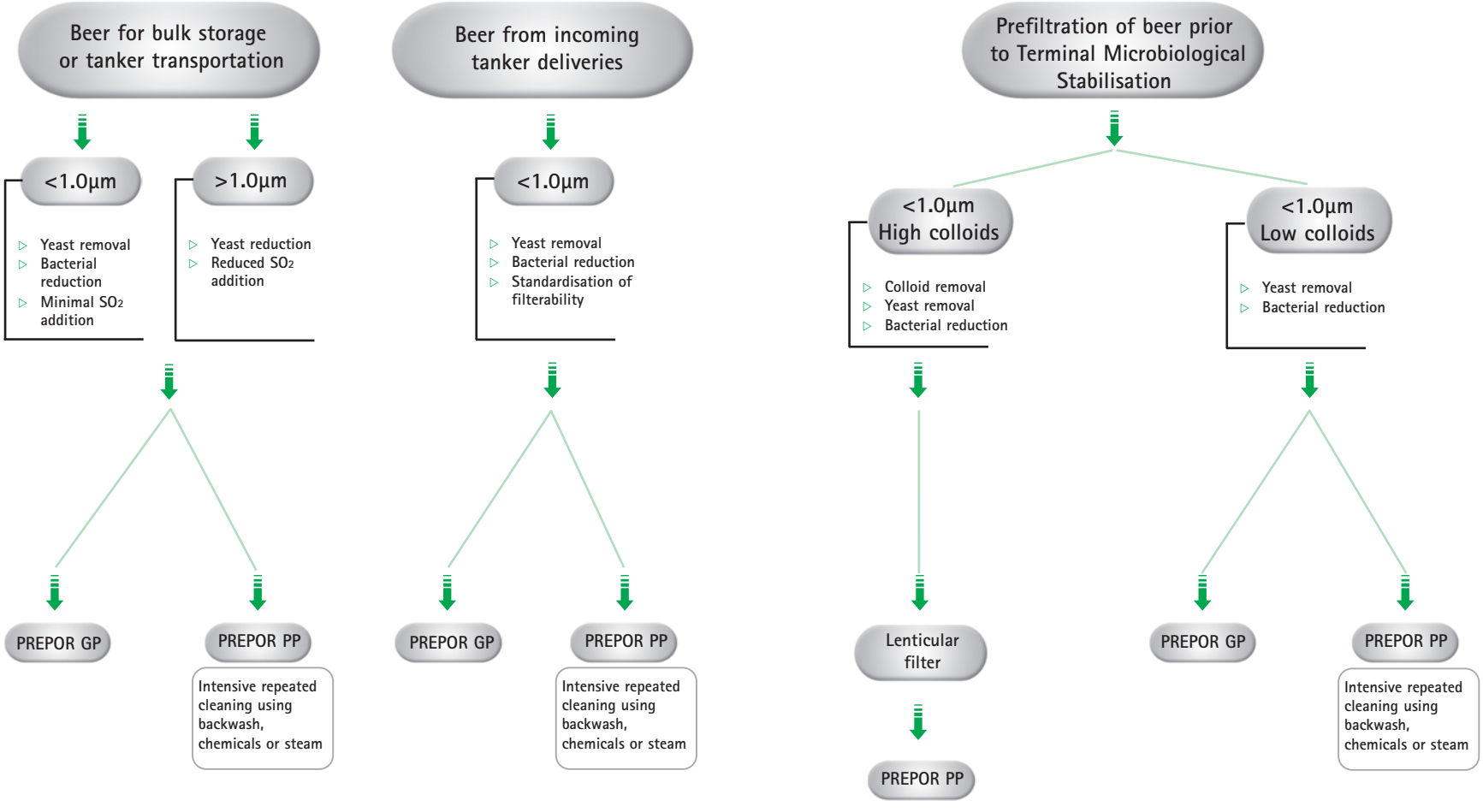
Typical methods of removing haze precursors are the addition of fining agents, or filtration using adsorptive powders such as diatomaceous earth (DE) or polyvinylpolypyrrolidone (PVPP). The porous screens, sheets or candles that are used to support the powder as it is dosed into the beer will always allow some powder through and trap filters should be positioned downstream to prevent this powder from reaching final storage and packaging. Alternatively, the DE and PVPP may be incorporated into a cellulose fibre matrix that is then cut into preformed sheets or assembled into stacked disc (or lenticular) cartridges. This may be a more convenient method of stabilisation and produces a higher degree of clarity to the beer.

Trap filtration is usually achieved using clarification filters with retention ratings between 5 µm and 15 µm for DE trap and 5 µm and 25 µm for PVPP. Medium and fine grades of sheet and lenticular filters will provide high product clarity and good physical stability.

Once the beer has been physically stabilised, further treatment usually involves assuring microbiological stability and polishing to provide bright clarity.

- **Strong, washable cellulose sheets support powder precoat in plate and frame filter presses.**
- **Trap filters remove small quantities of powder released from upstream processing and protect the process in the event of major bed collapse.**
- **Adsorptive filter sheets and lenticular cartridges provide clarification and physical stabilisation.**
- **Designs that optimise performance in forward flow and backwashable applications.**

# Standardisation and Intermediate Stabilisation



# Standardisation and Intermediate Stabilisation

## protection during storage and transport

Whilst alcohol and hops serve to stabilise the beer to some extent during short-term storage or transport the beer may still be susceptible to further microbiological activity. This can be due to continued fermentation by residual brewing yeast; yeast autolysis; ingress of wild yeasts or the activity of many other bacteria.

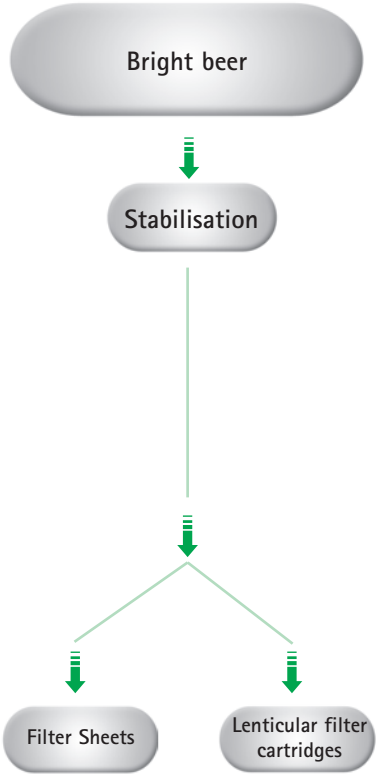
Preventing the ingress of extraneous organisms can be achieved by minimising the head space in storage vats and transport tanks and ensuring that sterilising filters are fitted to tank vents and in feed lines for top pressure carbon dioxide. Filters from the BIO-X and TETPOR families should be used.

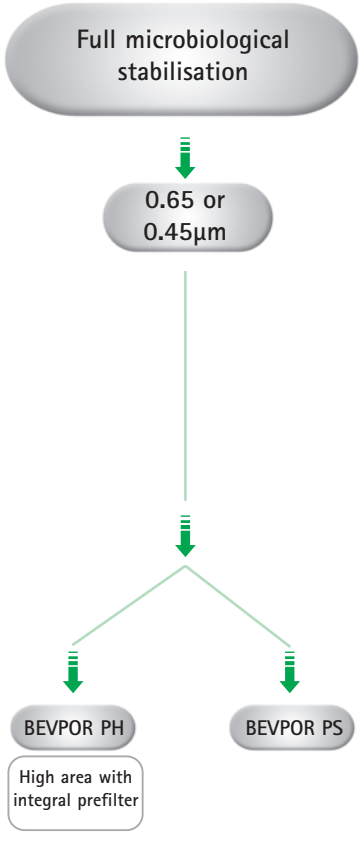
Low levels of sulphur dioxide are still used in some areas to microbiologically stabilise the beer during storage and packaging. It also acts as an oxygen scavenger. However, even at low levels, sulphur dioxide may result in flavour taints. Filtration using PREPOR PP or PREPOR GP filter cartridges reduces the risk of microbiological spoilage of the beer. This can lead to the significant reduction, or elimination of sulphur dioxide. The high removal efficiency of the cartridges provides removal of yeast and significant reduction of bacteria. For high alcohol, very stable beers, these filters can provide a bright, yeast-free product. For beers that are more susceptible to microbiological spoilage, the filters can be used to remove most of the microbiological loading prior to terminal microbiological stabilisation using microporous membrane or pasteurisation.

Due to their microporous depth characteristics filters also improve the filterability of the beer, protecting downstream membranes from premature blockage due to low levels of colloidal content. In particular, PREPOR PP which can be repeatedly hot water washed, steam sterilised and chemically cleaned can be used as an alternative to sheet filters and provides an effective means of standardising filterability .

- **Can be used in conjunction with crossflow microfiltration to remove yeast.**
- **Removal of yeast and reduction of bacteria prior to bulk storage or tanker transportation.**
- **Filterability adjustment and standardisation of incoming beer deliveries.**
- **Colloid reduction or removal.**
- **Yeast removal and reduction of bacteria prior to microporous membrane filtration.**
- **Sterilisation of gases in contact with the beer.**

# Terminal Microbiological Stabilisation



# Terminal Microbiological Stabilisation

## maximising the packaged microbiological shelf life

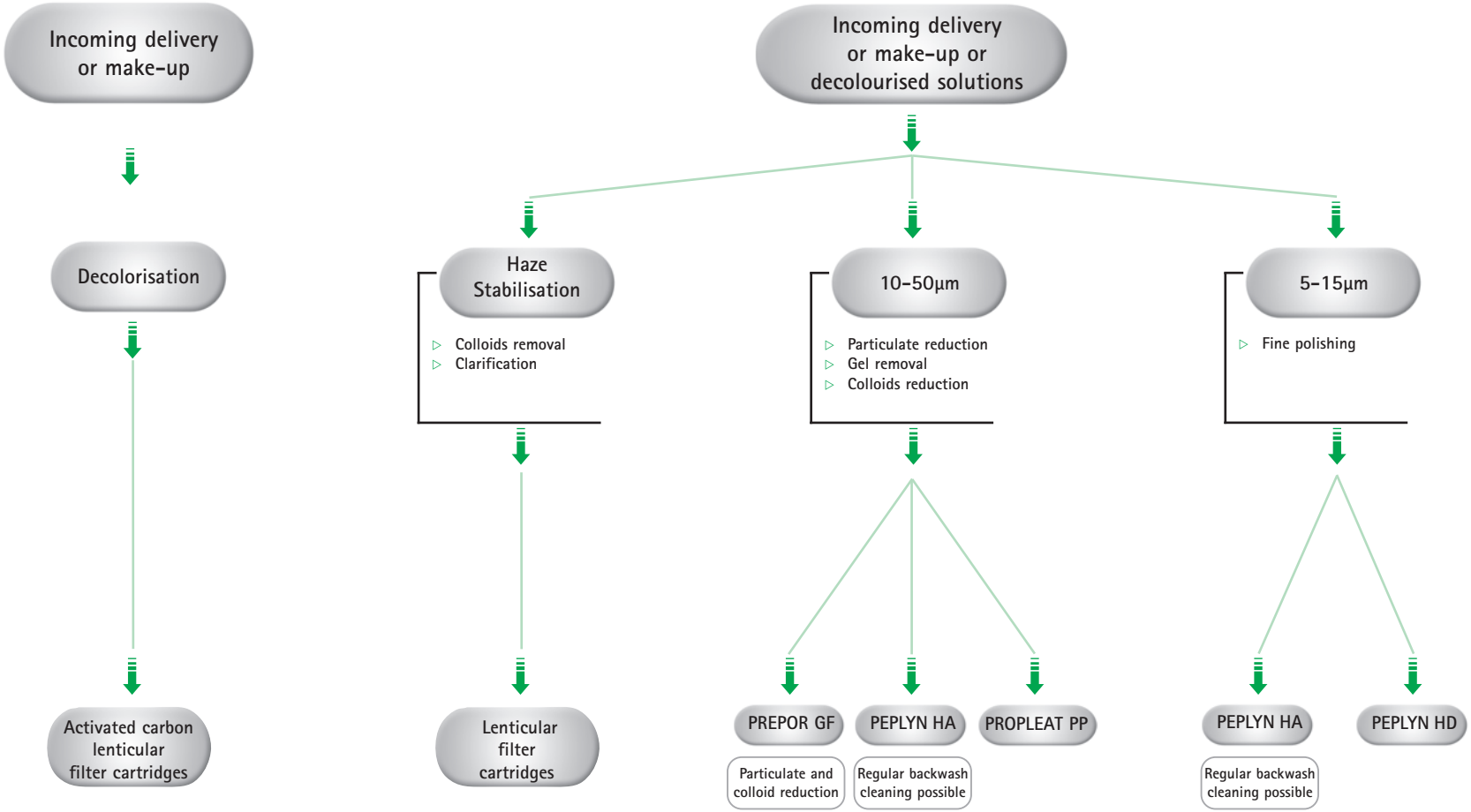
Preparation of beer prior to packaging should be aimed at preserving or enhancing the products' sensory qualities that have developed during boil and maturation. When ready for packaging, any physical instability of the beer should already have been addressed and the only requirement is to ensure that the microbiological shelf life is achieved. Pasteurisation is the usual method adopted, either flash pasteurising the beer on its way to the filling station or by heating the final packaged product. However, even minimal heat treatment will lead to sensory change of the product, which is exacerbated and can become unacceptable if dissolved oxygen content is high.

Terminal microbiological stabilisation using membrane microfiltration cartridge filters is carried out immediately prior to packaging. Unlike heat or chemical stabilisation, properly selected microfiltration will not impair the organoleptic qualities of the beer.

Membrane retention ratings of 0.65 µm or 0.45 µm are sufficient to remove common beer spoilage organisms. For canned and bottled beer, 0.65 µm should provide the desired stability. However 0.4 µm is increasingly being chosen by a greater number of brewers as it has the ability to remove a wider range of microorganisms, including extraneous non-spoilage species that may be present. The BEVPOR range of polyethersulphone (PES) microfiltration membrane cartridges is ideal for this application. The range also includes 0.8 µm or 1.2 µm pore sizes for instances where yeast content is the only concern, for example in keg beers that only require a shelf life of weeks.

All components of the products, especially the PES membrane, have been designed to ensure that their effect on characteristics such as colour, foam retention and taste are minimal, avoiding the need for flushing the filter prior to use that some polymers such as nylon or cellulose acetate may require. There are also a number of constructional options to suit a wide range of operational requirements, beer qualities and process conditions.

- **Choice of constructional options to cater for various operational requirements and beer qualities.**
- **Range of pore sizes to remove yeast and common spoilage organisms.**
- **Minimal adsorption of beer components ensures that desirable characteristics are not affected.**
- **High loading asymmetrical pore structure with integral prefilter options to maximise service life.**
- **Wide chemical resistance enables chemical and enzymatic regeneration to extend service life.**
- **Repeatedly testable enabling easy monitoring for quality assurance and HACCP records.**


Incoming delivery or make-up
Decolorisation
Activated carbon lenticular filter cartridges
Incoming delivery or make-up or decolourised solutions
Haze Stabilisation
Colloids removal
Clarification
Lenticular filter cartridges
10-50µm
Particulate reduction
Gel removal
Colloids reduction
PREPOR GF
Particulate and colloid reduction
PEPLYN HA
Regular backwash cleaning possible
PROPLEAT PP
5-15µm
Fine polishing
PEPLYN HA
Regular backwash cleaning possible
PEPLYN HD

# Ingredients & Additives

## creating uniform consistency

Ingredients and additives are relatively small, but important, additions to the process that can be troublesome if not handled correctly.

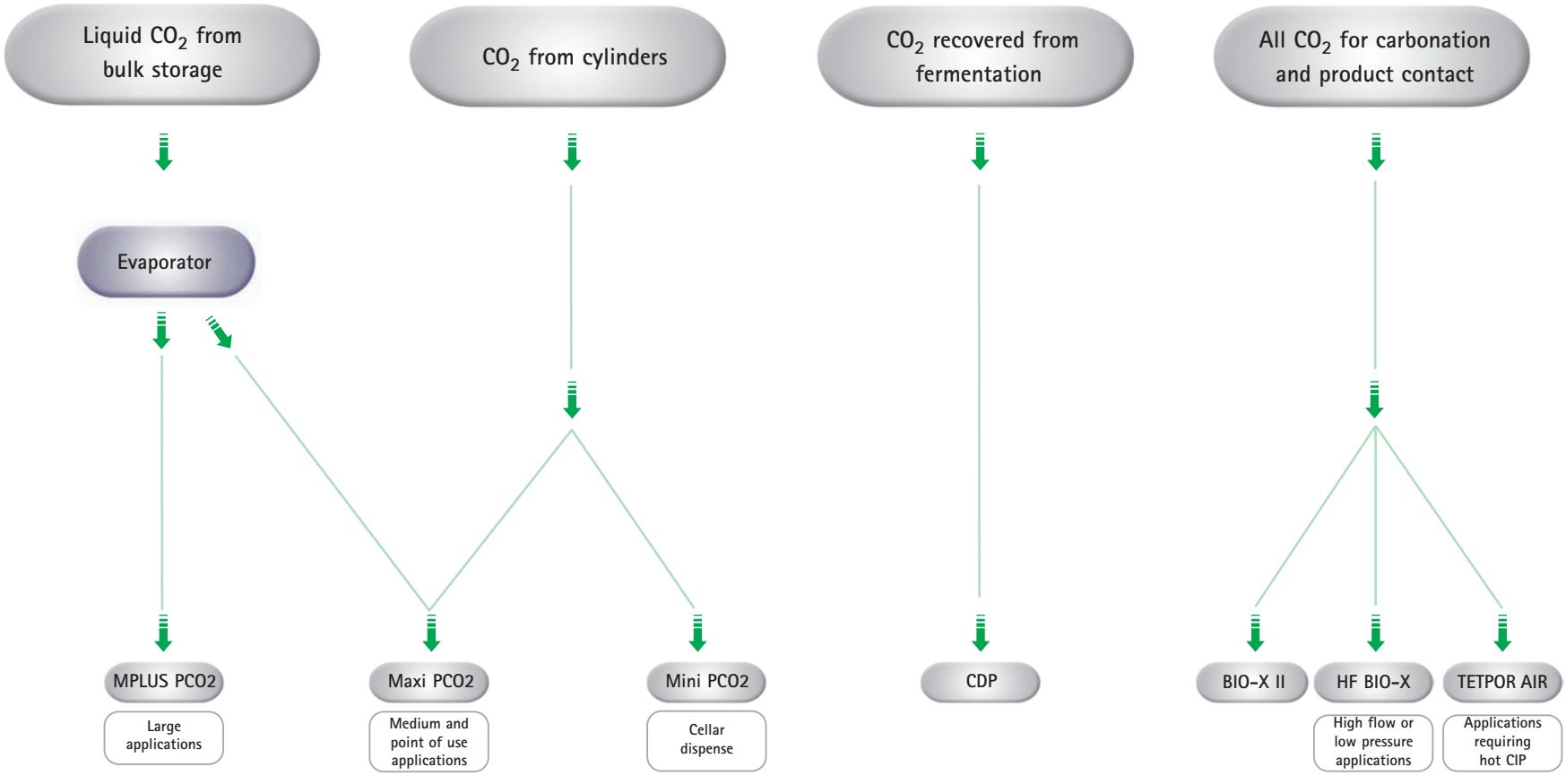
Liquid sugar additions are common and due to their concentration are usually microbiologically stable. Potential particulate contaminants may be present from storage vessels and pipework, or from upstream processing such as decolorisation using granular activated carbon. Clarification filters can be used to remove particulate down to levels of around 5µm. If further colour reduction is required, this can be preceded with activated carbon lenticular filter cartridges.

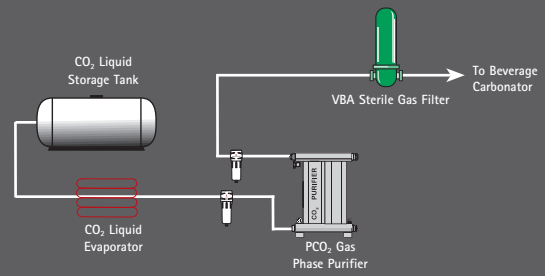
Propylene glycol alginate (PGA) is soluble in beer but can often contain gel clots, particularly after prolonged storage, that are difficult to dissolve. Clarification filters that can be regular cleaned will remove the gel and provide long-term lifetime.

In order to minimise the amount used concentrated flavourings are usually added to bright beer. High concentrated flavourings and fruit juices may require colloidal hazes to be removed prior to addition or they risk impairing the haze of the beer. Lenticular filter cartridges containing diatomaceous earth (DE) or polyvinylpolypyrrolidone (PVPP) deal effectively with many hazes and haze precursors.

Storage of any food ingredients is best conducted in oxygen-free atmosphere to prevent oxidative deterioration. The use of nitrogen prevents deterioration of the ingreditents and is discussed more fully in the Nitrogen section.

- **Colour removal from additives.**
- **Particulate removal for general clarification and fine polishing.**
- **Removal of haze and haze precursors using adsorptive lenticular filter cartridges.**
- **Inert atmosphere storage to prevent oxidative deterioration.**


Liquid $CO_2$ from bulk storage
$CO_2$ from cylinders
$CO_2$ recovered from fermentation
All $CO_2$ for carbonation and product contact
Evaporator
MPLUS PCO2
Large applications
Maxi PCO2
Medium and point of use applications
Mini PCO2
Cellar dispense
CDP
BIO-X II
HF BIO-X
High flow or low pressure applications
TETPOR AIR
Applications requiring hot CIP




# Carbon Dioxide

## ensuring freshness from bulk storage to dispense

Carbon dioxide is widely used throughout the brewery and packaging areas. It is present naturally in the beer as a by-product of fermentation. Its presence can be enhanced using secondary fermentation methods in cask or bottle, or by carbonation using recovered or delivered gas. If recovered carbon dioxide is used, some treatment may be necessary to remove undesirable flavour components from the fermentation process. Delivered carbon dioxide should conform to recognised beverage specifications, but there is still a risk associated with cylinder and line contamination or from the petrochemical source of the gas.

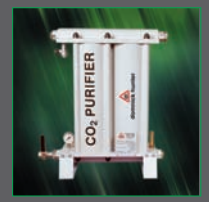
PCO2 and CDP carbon dioxide polishers are designed to give Quality Incident Protection against out of specification $CO_2$. Utilising a multiple-barrier approach both systems are proven to offer effective protection from a wide range of potential contaminants commonly found in gas supplies.

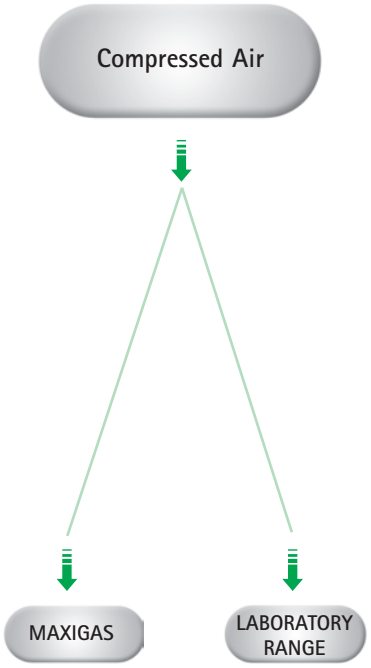
Constructed using a modular design both systems are available in capacities to meet most applications. Small- scale systems are also available for use in retail cellar dispense and laboratory applications.

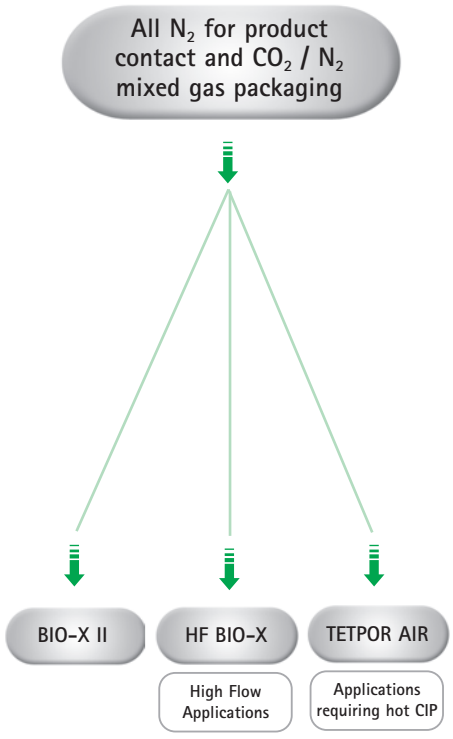
As well as gaseous contamination, preventing the ingress of extraneous particulate and microorganisms during storage and transportation can be achieved by using filters from the BIO-X and TETPOR product ranges.

Any secondary sources of carbon dioxide used to carbonate beer should also be treated to protect against microbiological contamination.

- Added security of $CO_2$ quality.
- Protection against impurities known to result in flavour defects.
- Effective at removing a combination of potential contaminants.
- Easy maintenance, disposable cartridge design.
- Compact design.





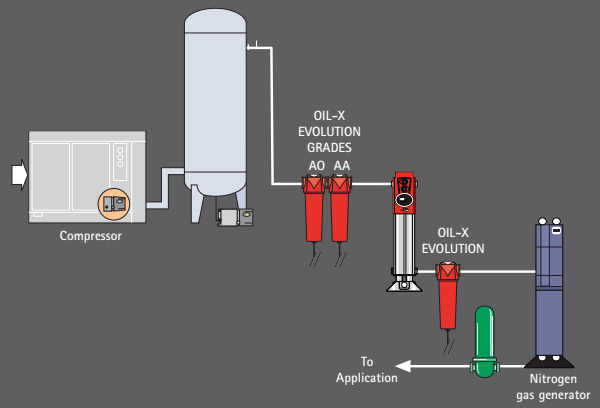




## NITROGEN GENERATORS

Compared to bulk liquid and cylinder nitrogen

- No long term contracts
- Fast payback
- Low space requirements
- No waste
- 24 hour operation
- Modular design allows expansion

## YOU CONTROL YOUR SUPPLY




# Nitrogen

## flexible options for minimising dissolved oxygen

The use of nitrogen in the brewery is increasing. It can be used in many of the applications that carbon dioxide has traditionally been used but has the advantage that it is less soluble and, now, is more readily available than delivered carbon dioxide.

Until recently, nitrogen was only available in delivered form, in bulk or cylinder. Now, a more flexible and economic option is available. MAXIGAS is a modular range of nitrogen generators that produces the nitrogen from compressed atmospheric air. MAXIGAS is able to produce a range of purities up to 99.999% and can be specified to provide nitrogen requirements for a range of applications in the brewery and packaging facilities.

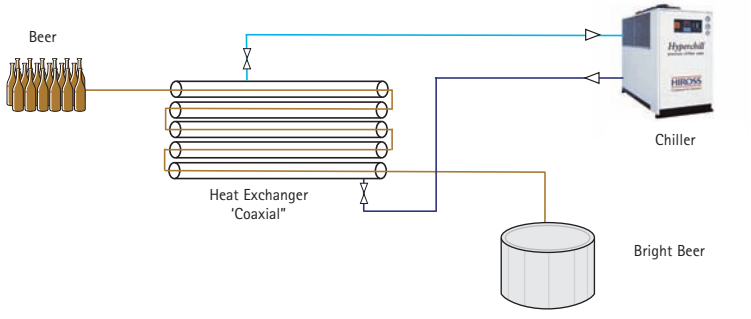
Nitrogen is used to prevent contact of ingredients with air, thereby reducing the potential for oxygen uptake. During bulk storage, the use of sealed tanks means that positive nitrogen pressure can be used, ensuring that volume changes due to temperature fluctuations do not lead to the ingress of air. Nitrogen blanketing of atmospheric tanks is also possible, a small continuous flow ensuring that air cannot diffuse into the headspace through vents and also compensating for volume changes. During emptying, the flow of nitrogen can be increased to fill the head-space and in sealed systems can be used to aid tank to tank transfer. Low oxygen levels will also suppress microbial growth.

Use of filters from the BIO-X and TETPOR families on tank vents and nitrogen inlets will ensure that particulate and microorganisms are removed from the gas streams.

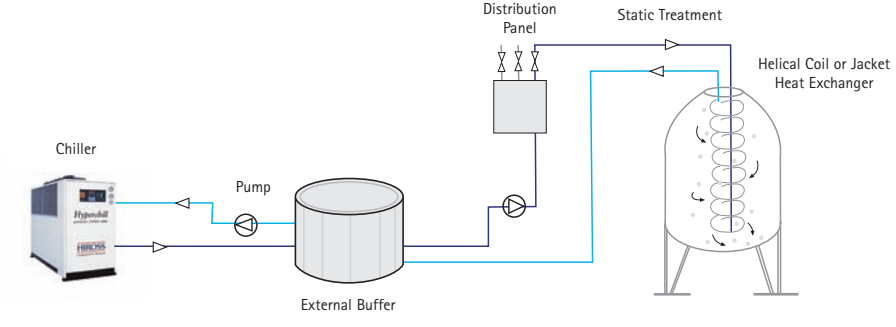
- On-demand nitrogen up to 99.999% purity.
- Modular, space-saving design that can be expanded as requirements increase.
- Low maintenance.
- Removal of particles, aerosols and bacteria from nitrogen distribution lines and tank vents.



## In-Line Chilling




## Tank Chilling



# Chilling

## creating the right environment

Low temperature storage is desirable throughout the post-fermentation processes. In addition, other specific chilling requirements may be needed:

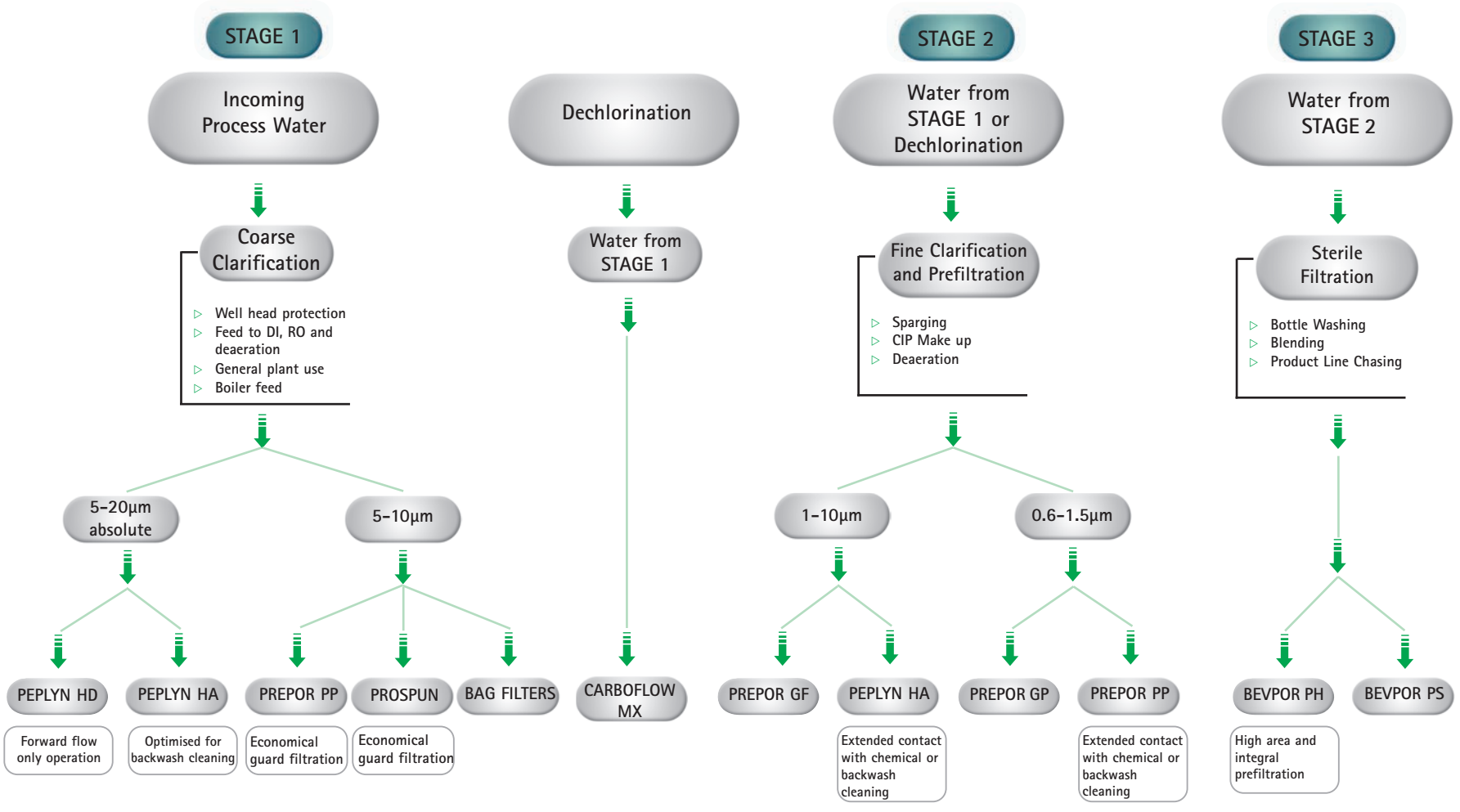
- To regulate the temperature during fermentation.
- During the layering process
- During filtration of 'ice' beers.

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 food and beverage industry has been introduced. Coupled with a sales and engineering team capable of providing customised solutions to meet individual needs, this provides a dedicated approach to the requirements of brewing applications.

The technology is characterised by a high refridgeration 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.

- **Standard and custom designed options provide unrivalled choice.**
- **Wide range of cooling capacities.**
- **Minimal space-saving footprint.**
- **Low energy consumption.**


STAGE 1
Incoming Process Water
Coarse Clarification
Well head protection
Feed to DI, RO and deaeration
General plant use
Boiler feed
5-20µm absolute
5-10µm
PEPLYN HD
Forward flow only operation
PEPLYN HA
Optimised for backwash cleaning
PREPOR PP
Economical guard filtration
PROSPUN
Economical guard filtration
BAG FILTERS
Dechlorination
Water from STAGE 1
CARBOFLOW MX
STAGE 2
Water from STAGE 1 or Dechlorination
Fine Clarification and Prefiltration
Sparging
CIP Make up
Deaeration
1-10µm
0.6-1.5µm
PREPOR GF
PEPLYN HA
Extended contact with chemical or backwash cleaning
PREPOR GP
PREPOR PP
Extended contact with chemical or backwash cleaning
STAGE 3
Water from STAGE 2
Sterile Filtration
Bottle Washing
Blending
Product Line Chasing
BEVPOR PH
High area and integral prefiltration
BEVPOR PS

# Water

## clear options, clear results

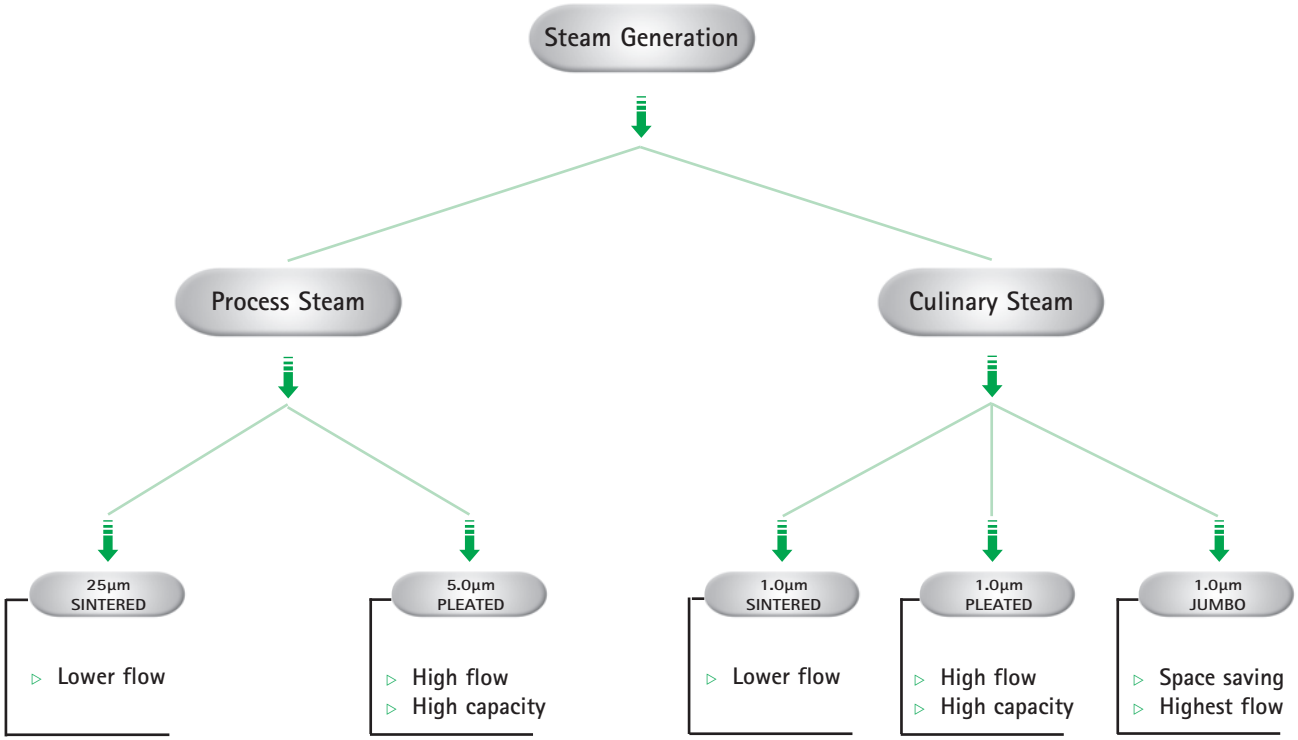
Water is an essential but expensive commodity. It has many uses in the brewery and the level of treatment required differs according to the source and quality of the incoming water, as well as the application that it is to be used for.

Water for general use will require coarse clarification to remove larger particles. This can be economically achieved using general clarification filters from the PROSPUN or PROPLEAT ranges. At the other extreme the water used for bottle washing or for blending should be sterile to ensure that no extraneous microorganisms are introduced to the beer. The same BEVPOR range of polyethersulphone (PES) membrane filters that is used for beer also suits water sterilisation. For intermediate production stages and make-up of CIP solutions, where the water is used to clean and sanitise pipework, bottling equipment and process filters, fine clarification offered by PREPOR GF and PEPLYN range filters are ideal.

Multiple-barrier techniques may be used, for example where water for blending requires softening or demineralisation. In this case, filter selection is based on the combined performance of the overall treatment process, protecting expensive ion exchange resins and reverse osmosis membranes and trap filtration to prevent shedding of ion exchange resin or carbon from granular treatment processes.

- **Wide range of retention ratings provides coarse and fine clarification and sterilising options.**
- **Options to suit filtration-only and multiple-barrier treatment.**
- **Dechlorination to prevent formation of flavour taints.**
- **High mechanical strength and chemical resistance enable washing and regeneration of the filters to increase service life.**
- **Direct impact on quality assurance and HACCP frameworks.**




Steam Generation
Process Steam
Culinary Steam
25µm SINTERED
Lower flow
5.0µm PLEATED
High flow
High capacity
1.0µm SINTERED
Lower flow
1.0µm PLEATED
High flow
High capacity
1.0µm JUMBO
Space saving
Highest flow

# Steam

## for general plant and culinary applications

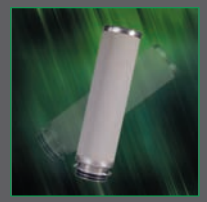
Steam used to sterilise product contact surfaces should be of culinary quality to ensure that it does not contaminate the product with particles or chemicals that could be damaging to the quality of the product or hazardous to the consumer. The water quality used for culinary steam generation is addressed in The Food and Drugs Administration's Code of Federal Regulations. The quality of the water and permitted boiler additives are addressed specifically in the following Code of Federal Regulations:

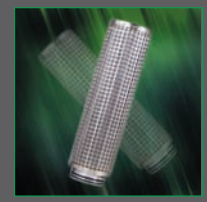
*Water Quality: CFR Title 40 Parts 141,142 and 143*
*and*
*Boiler Additives: CFR Title 21 Chapter 1, Section 173.310*

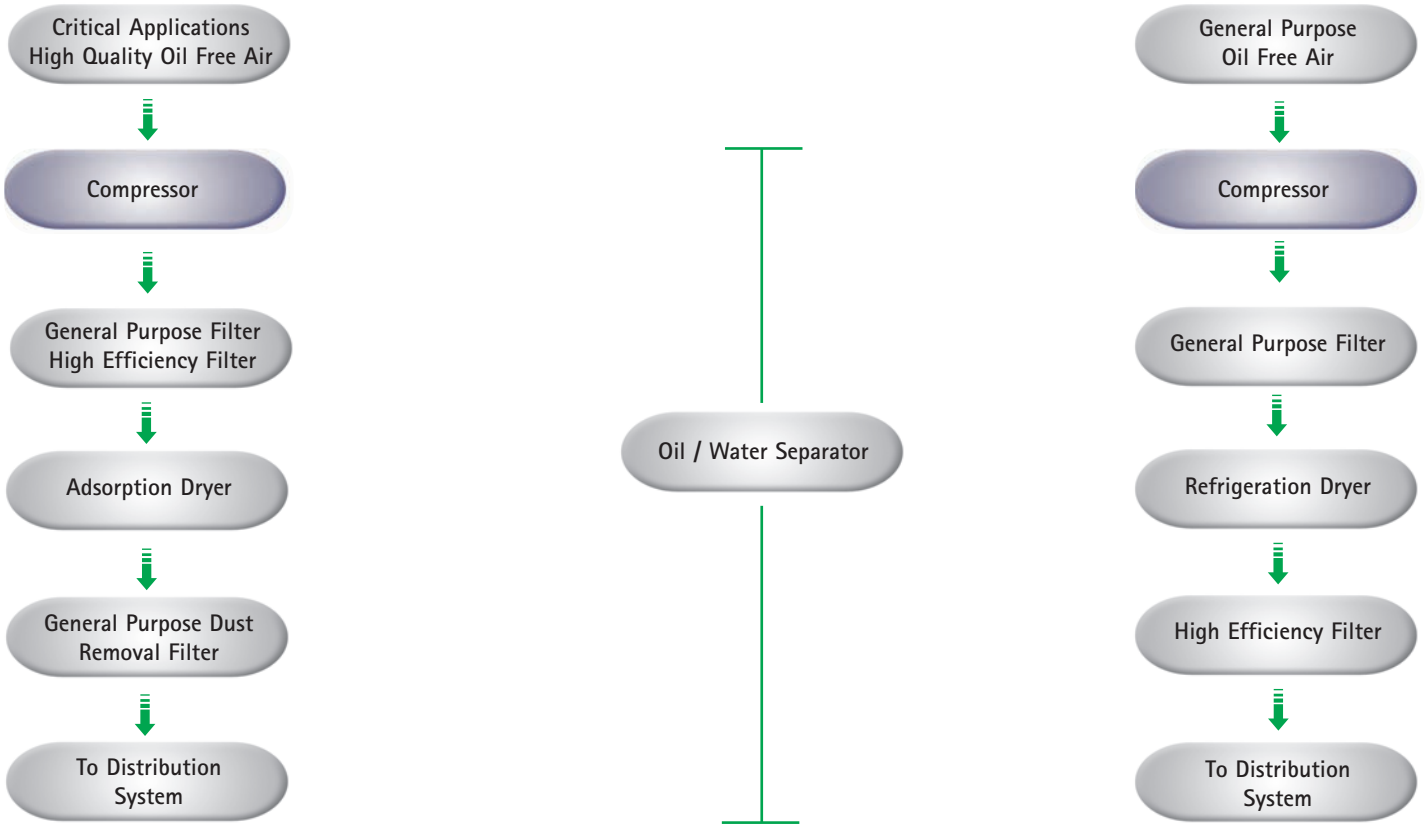
Other aspects to its treatment are provided in 3-A standard 609-03. This states that pipework and associated equipment should be constructed from 300-series stainless steel and that filters used for particulate removal should be capable of retaining >95% of particles of size 2 micron or larger.

Parker domnick hunter provides a number of steam filtration options for general and culinary use together with a comprehensive guide to their selection.

- **Stainless steel housing and filter cartridges for general or culinary use.**
- **Sintered and pleated fibre filters options provide wide sizing options.**
- **Jumbo range for high volume applications.**
- **Comprehensive guide to steam quality guidelines, filter section and sizing.**

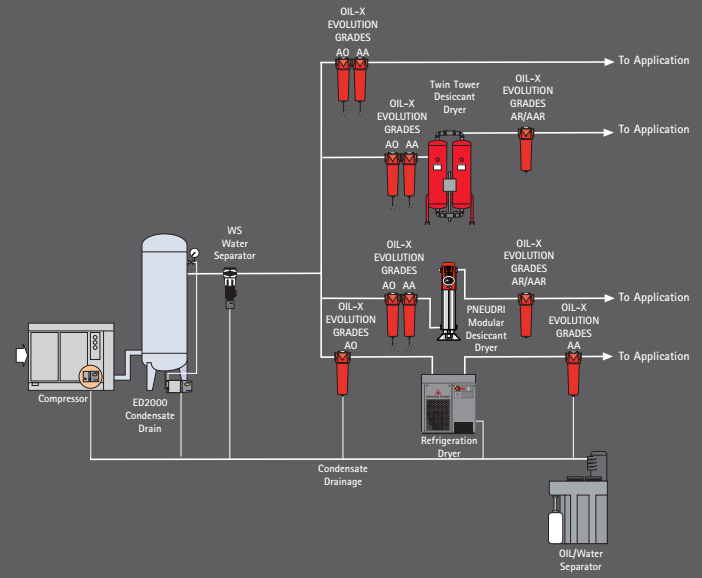





Critical Applications
High Quality Oil Free Air
Compressor
General Purpose Filter
High Efficiency Filter
Adsorption Dryer
General Purpose Dust
Removal Filter
To Distribution
System
Oil / Water Separator
General Purpose
Oil Free Air
Compressor
General Purpose Filter
Refrigeration Dryer
High Efficiency Filter
To Distribution
System

# Compressed Air

## selecting the ideal management system for your needs




The quality of air required throughout a typical compressed air system can vary. The extensive range of purification equipment available from Parker **domnick hunter** is ideal for both centralised and decentralised compressed air systems. This allows the user to tailor the quality of air for each specific application, from general purpose ring main protection, through to critical clean dry air (CDA) point of use.

**Parker domnick hunter** can tailor its range of purification equipment to exactly match system requirements, ensuring both capital and operational costs are kept to a minimum.

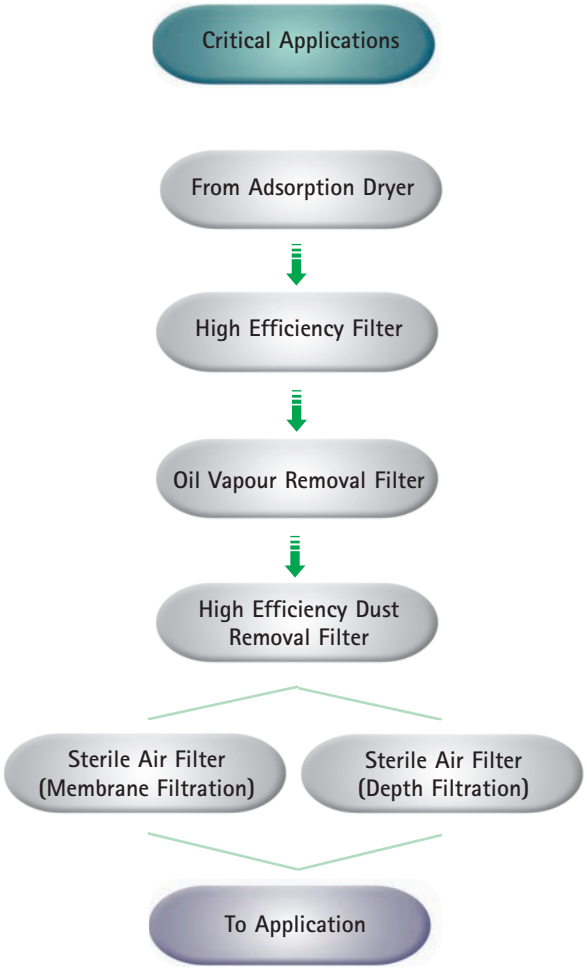
To achieve the levels of cleanliness specified by ISO 8573.1 2001 a careful approach to system design, commissioning and operation must be employed.

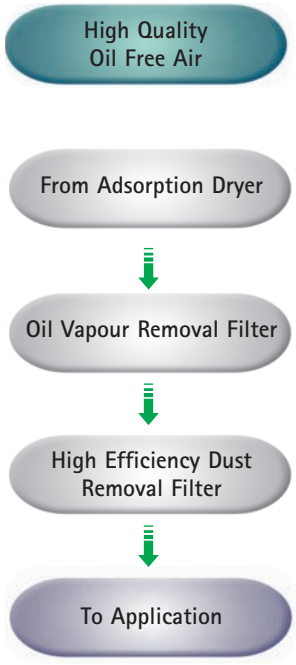
It is highly recommended that the compressed air is treated prior to entry into the distribution system as well as at each usage point or application.

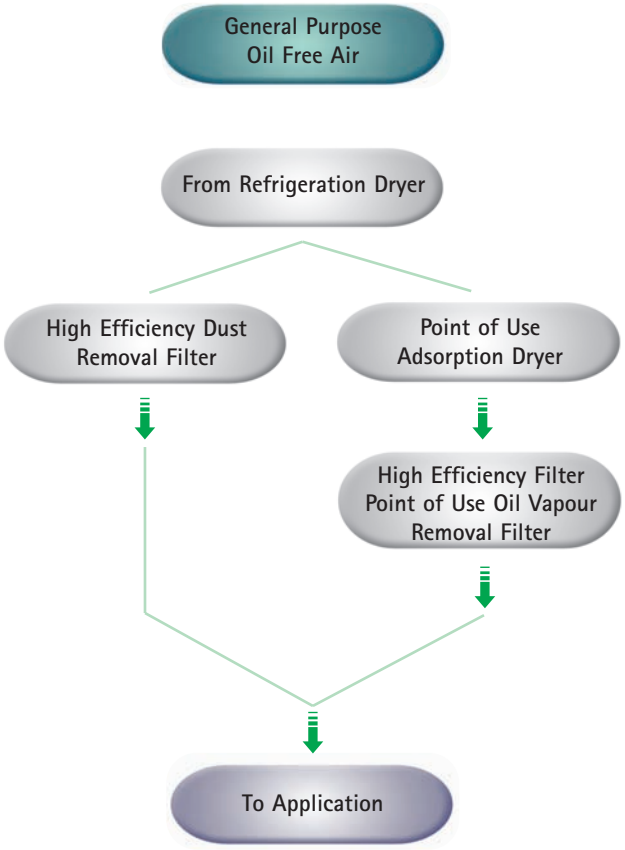
This approach to system design provides the most cost effective solution to system purification as it not only removes the contamination already in the distribution system, it ensures that only the most critical areas's receive air treated to the highest level.

- International system of air quality classification.
- From compressor house to point of application.
- best criteria for selecting the correct air treatment products.
- See publication 17 400 4765 for detailed information.



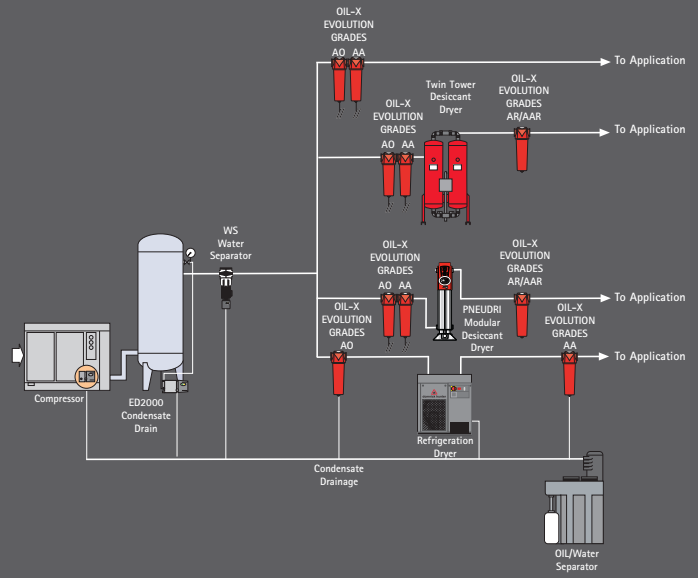

Critical Applications
From Adsorption Dryer
High Efficiency Filter
Oil Vapour Removal Filter
High Efficiency Dust Removal Filter
Sterile Air Filter (Membrane Filtration)
Sterile Air Filter (Depth Filtration)
To Application


High Quality Oil Free Air
From Adsorption Dryer
Oil Vapour Removal Filter
High Efficiency Dust Removal Filter
To Application


General Purpose Oil Free Air
From Refrigeration Dryer
High Efficiency Dust Removal Filter
Point of Use Adsorption Dryer
High Efficiency Filter Point of Use Oil Vapour Removal Filter
To Application

# Compressed Air Applications

## high quality compressed air from generation to application




Compressed air can be an expensive commodity if not efficiently managed. As well as the primary costs associated with the production of compressed air and losses from leaking distribution systems, poor management of compressed air can lead to rapid deterioration of the distribution system, failure of equipment due to oil, water and particulate carry-over, and bacterial traps sensory taints in the final product.

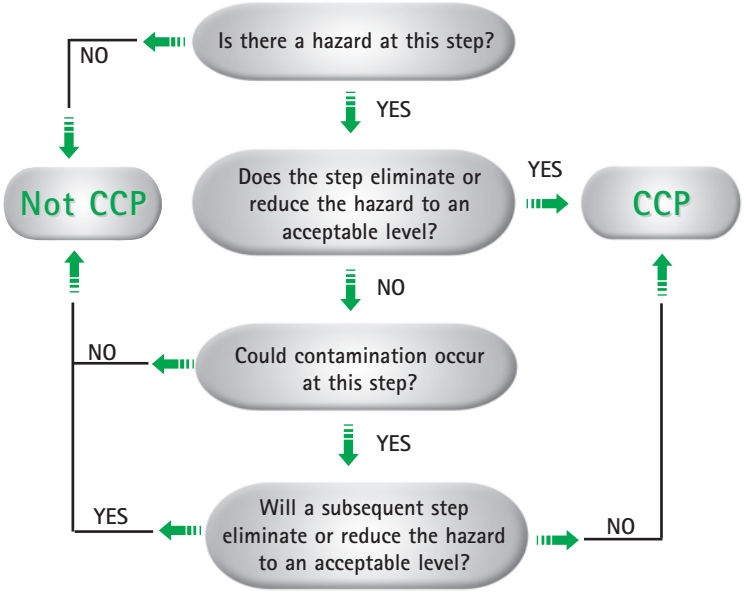
Management of compressed air falls into three main categories:

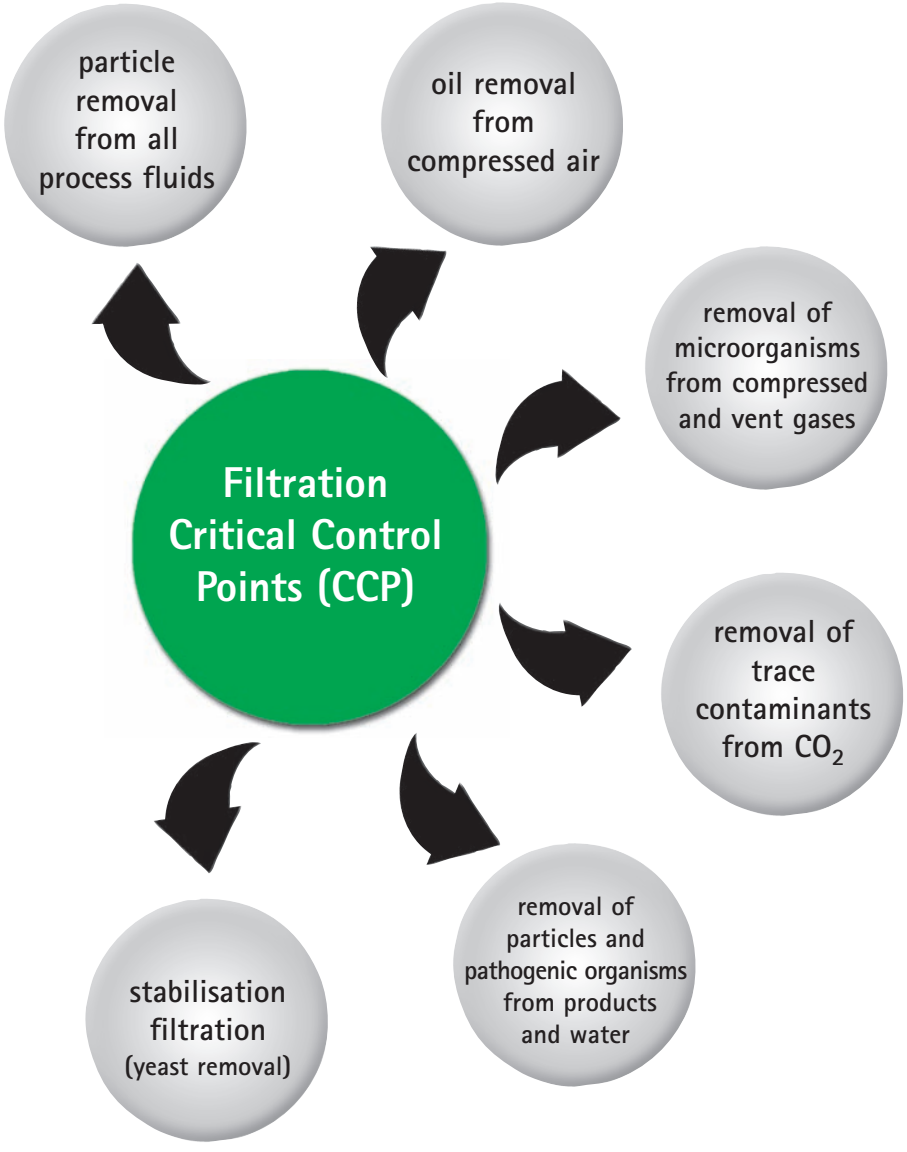
- Effective removal of all contamination in the form of dirt, oil, water and microorganisms.
- Minimising pressure losses between the compressor and the point of application.
- Eliminating losses from the system due to leaks, uneconomical regeneration of drying plant and inefficient condensate drains.

**Parker domnick hunter** offers unrivalled expertise in the purification of compressed air and works in partnership with many of the world's leading compressor manufacturers. In order to explain the various forms of compressed air treatments **Parker domnick hunter** has published a guide to ISO 8573.1:2001 Air Quality Classes. This provides an in-depth guide to identifying the air quality that best suits the needs of different applications.

- **Easy to understand guide to air quality classes.**
- **Filters for coalescing aerosols oil from the compressed air stream.**
- **Range of desiccant and refrigeration dryers to suit varied needs.**
- **Sterilising filters for high pressure (compressor) lines.**
- **Sterilising filters for low pressure (blower) applications.**

## Codex Decision Tree



# HACCP and Integrity Testing

## using filtration to ensure quality and safety

### HACCP

If precautionary measures are not in place during production, products may be contaminated biologically, chemically or physically. "Hazard Analysis of Critical Control Point" (HACCP) is a food safety management system acknowledged by governments, regulatory control bodies and the food industry as a system that identifies and monitors specific food safety hazards and risks.

Microporous filter products are used by a number of industries to achieve required levels of purity in both gases and liquids. The verification of filter performance has been identified as an important process monitor.

The HACCP programme should be applied from the production, supply and handling of unprocessed material, to the processing, distribution and consumption of the final product. Global markets are demanding more than ever that potential food safety risks are managed.

### ASSURED PERFORMANCE

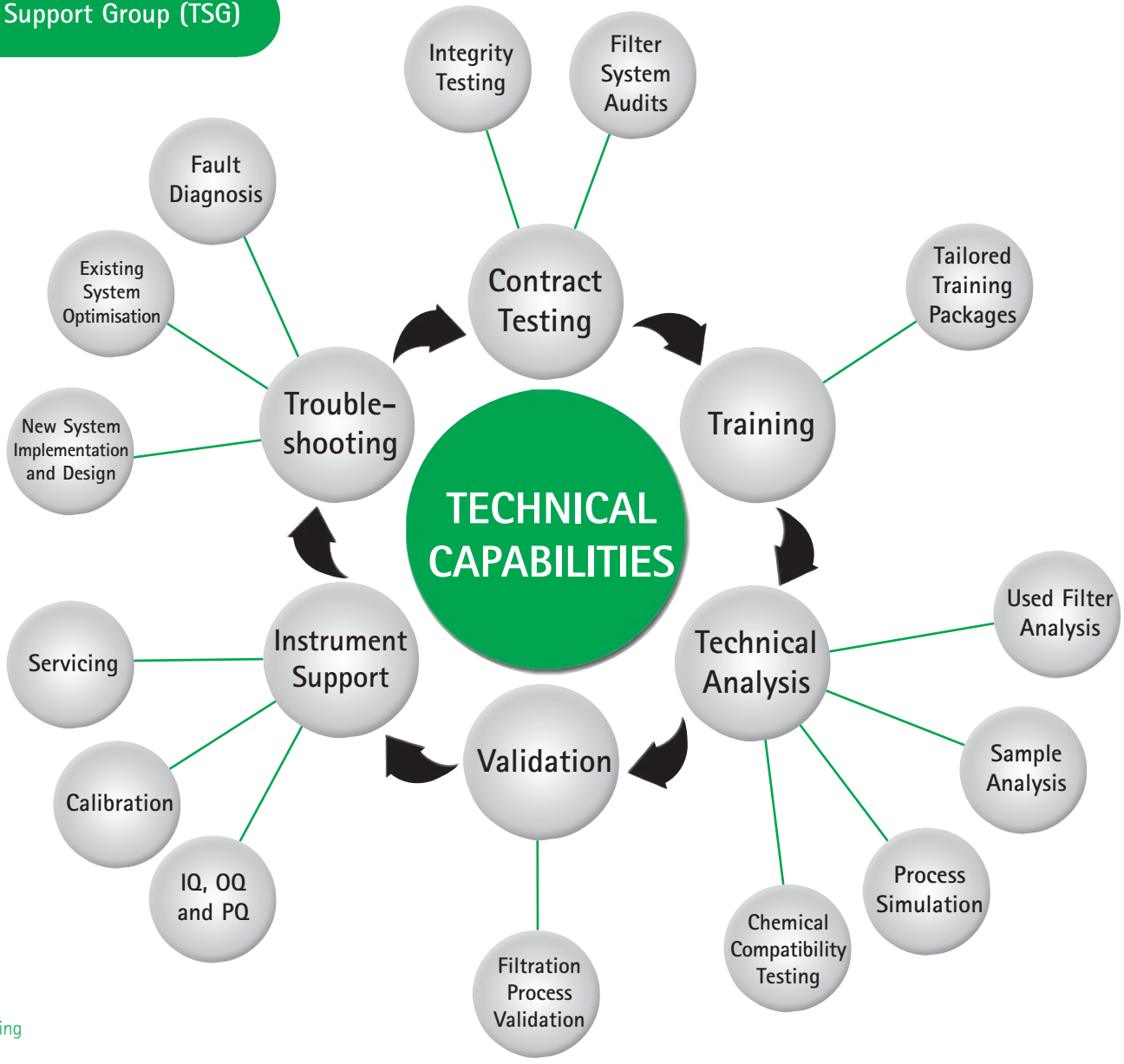
The ability to test the integrity of a filter provides a valuable quality tool. A properly conducted integrity test provides assurance that the filter will fulfil the role that it was designed for, ensuring that it is fit for purpose BEFORE a process run is initiated. As well as installing confidence in the filter, recording integrity test results demonstrates sound process quality monitoring and provides a test protocol that fits well into a HACCP framework.

### VALAIRDATA II

VALAIRDATA II uses an aerosol integrity test, to make it the most effective and practical integrity test for sterile gas filters.

### BEVCHECK

BEVCHECK is a hand-held instrument that provides a convenient and easy means of carrying out pressure decay and diffusional flow integrity tests on liquid filters or sterile gas filters.


TECHNICAL CAPABILITIES
Contract Testing
Integrity Testing
Filter System Audits
Training
Tailored Training Packages
Technical Analysis
Used Filter Analysis
Sample Analysis
Process Simulation
Chemical Compatibility Testing
Validation
Filtration Process Validation
Instrument Support
IQ, OQ and PQ
Calibration
Servicing
Trouble-shooting
New System Implementation and Design
Existing System Optimisation
Fault Diagnosis

# Technical Support Group

## dedicated support team

**Parker domnick hunter** has a multi-disciplinary team of scientists and engineers dedicated to the technical support of our products. Situated at facilities around the globe including centres of excellence in Birtley, UK and Oxnard, USA.

Through the Technical Support Group (TSG) and Laboratory Service Group (LSG), our teams assist clients in the selection and design of filtration systems coupled with ongoing support including: validation services, instrument servicing and calibration, contract testing, delivery of training programmes, on-site support (system optimisation, trouble shooting) and an advisory service.

The commitment of our people is backed up by state-of-the-art facilities. Our Birtley site has been the subject of a major investment programme to extend existing laboratory, manufacturing and training capabilities. This supports our commitment to provide world-class products and support services.

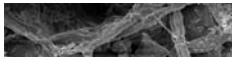
- Filtration process validation
- Industry tailored training
- Process optimisation
- Instrument support

Also available for sampling and small scale applications.

## Liquid Prefilters
### Clarification

| | PEPLYN HD | PEPLYN HA | PREPOR GF | PROPLEAT | PROSPUN | BAG FILTERS |
|---|---|---|---|---|---|---|
| |  |  |  |  |  |  |
| Filtration Media | Polypropylene | Polypropylene | Glass microfibre | Polypropylene | Polypropylene | Various |
| Retention Rating | 5 – 35 microns absolute | 3 – 100 microns absolute | 2 – 10 microns absolute | 1 – 75 microns | 0.5 – 75 microns | Medium to coarse |
| Key Benefits | ■ Graded density and increased depth resulting in high dirt holding capacity<br>■ Ideally suited to high volume, forward flow processes | ■ Graded density results in high dirt holding capacity<br>■ Optimised pleat configuration maximises backwash efficiency<br>■ Wide range of chemical resistance improves chemical regeneration | ■ High voids volume glass microfibre media provides high dirt holding capacity<br>■ Higher flow than polypropylene media results in low pressure drop even in viscous liquids | ■ Economical general clarification<br>■ Higher area than spun products provides longer life to blockage | ■ Economical general clarification<br>■ Excellent first-stage protection of downstream processes | ■ Economical general clarification in non-critical applications |

## Liquid Prefilters
### Stabilisation

| | PREPOR GP | PREPOR PP | FILTER SHEETS | LENTICULAR FILTER | CARBOFLOW MX |
|---|---|---|---|---|---|
| |  |  |  |  | |
| Filtration Media | Glass microfibre Polypropylene | Polypropylene | Cellulose / diatomaceous earth | Cellulose / diatomaceous earth | Extruded activated carbon |
| Retention Rating | 0.6 – 1.5 microns stabilising | 0.6 – 1.5 microns stabilising | Stabilising - coarse and powder support grades | Stabilising - coarse | Adsorptive colour, odor and taste removal |
| Key Benefits | ■ Composite media provides high strength and dirt holding capacity<br>■ High efficiency removal of spoilage organisms and yeast<br>■ Improves filterability which increase the life to blockage of downstream membrane filters | ■ Maximised chemical and mechanical resistance for repeated regeneration<br>■ Yeast removal and spoilage organism reduction<br>■ Improves filterability which increase the life to blockage of downstream membrane filters | ■ Adsorptive and mechanical filtration provides high clarity and physical stability<br>■ Stabilising grades to remove yeast and spoilage organisms | ■ Adsorptive and mechanical filtration provides high clarity and physical stability<br>■ Stabilising grades to remove yeast and spoilage organisms<br>■ Convenient fully enclosed design | ■ High capacity, long life<br>■ Extruded media provides particulate reduction as well as adsorption |

Also available for sampling and small scale applications.

## Sterile Liquid Filters

| | BEVPOR PS | BEVPOR PH | BEVPOR PT |
|---|---|---|---|
| |  |  |  |
| Filtration Media | Polyethersulphone | Polyethersulphone | Polyethersulphone |
| Retention Rating | 0.2 - 1.2 microns sterilising | 0.2 - 1.2 microns sterilising | 0.2 - 0.65 microns sterilising |
| Key Benefits | ■ Can be sanitised and regenerated for extended life<br>■ Low adsorption of protein colours and flavours | ■ Integral prefilter layer maximises service life<br>■ Can be sanitised and regenerated for extended life<br>■ Higher surface area extends service life | ■ Prefilter layer removes colloids extending service life<br>■ Low adsorption of protein, colours and flavours |

## Steam Filters

| | SINTERED | PLEATED |
|---|---|---|
| |  |  |
| Filtration Media | 316L | 316L |
| Retention Rating | 1.0 - 25 microns | 1.0 - 5.0 microns |
| Key Benefits | ■ Ideally suited for low flow rate applications<br>■ Available in culinary grade 1 micron<br>■ Low pressure drops | ■ Re-cleanable metal fibre 316L Stainless Steel<br>■ Exceptionally high flow rates<br>■ Available in culinary grade 1 micron |

## Sterile Gas and Vent Filters

| | HIGH FLOW BIO-X | BIO-X | TETPOR AIR |
|---|---|---|---|
| |  |  |  |
| Filtration Media | PTFE Impregnated Glass Fibre | Glass Microfibre | Polypropylene Expanded PTFE |
| Retention Rating | 0.01 microns sterilising | 0.01 microns sterilising | 0.01 microns sterilising |
| Key Benefits | ■ 94% voids volume PTFE impregnated GF<br>■ Exceptional flow rates with low pressure drops<br>■ Full range of Retrofits<br>■ Integrity testable by aerosol challenge | ■ High Temperature operation 200°C (329°F)<br>■ Robust construction | ■ Assured biosecurity with absolute rated filtration<br>■ High voids volume PTFE membrane<br>■ Unique prefilter layer<br>■ Steam sterilisable to 142°C (287°F) |

## Integrity Test

| | VALAIRDATA II | BEVCHECK |
|---|---|---|
| |  |  |
| Tests | ■ Aersol challenge | ■ Pressure decay<br>■ Diffusional flow |
| Key Benefits | ■ 30 second test fro single 10" cartridge, filter back in use immediately after test<br>■ Increased sensitivity compared to liquid based test<br>■ Easily applied to multi-cartridge systems | ■ Portable - lightweight,hand held unit<br>■ Simple to use - pre-programmed operation<br>■ Flexible - wide range of test parameters<br>■ Robust - IP53 protection and wipe-clean surfaces<br>■ Stores up to 100 test reports |

For full range of Custom and Industry Specific Housings and Skids please contact Parker domnick hunter

# MAXIGAS

## nitrogen generators

- Convenient, Secure Supply
- The Safest Supply
- Generate The Right Purity
- Space Saving
- Easy to increase supply as required

You can now generate your own nitrogen gas at the press of a button - as much or as little as you need, at a fraction of the cost of your existing supply and at the purity your process requires. The generators are virtually maintenance free. Simply switch on and let your Parker domnick hunter nitrogen generator do the rest.

**For more information publication number: 174004791**

# ES2000

## oil / water separators

- Help to protect and maintain the environment
- Efficiently separate oil and water on-site and return upto 99.9% of the condensate to foul sewers
- Meet trade effluent discharge regulations
- Rapid payback over conventionnal disposal methods

Discharging oil contaminated condensate from compressed air systems is not only harmful to the environment, it is invariably illegal.

Oil spillages from industry do not have to be big to be serious. One litre of oil can cover 3500m$^2$ of water surface. One gallon of oil can cover 4 acres of water surface.

**For more information publication number: 174004429**

# OIL-X EVOLUTION

## compressed air filters

- High quality ISO 8573.1 : 2001 compressed air
- Running costs that start low and stay low

OIL-X EVOLUTION has been designed from the outset with the key design focus concentrated in critical areas such as air flow management, filtration media selection and construction and the efficient removal of coalesced liquid. OIL-X EVOLUTION has also been designed to be fully compliant with the latest ISO8573.1 : 2001 air quality standards as well as the forthcoming ISO12500 standard for filter testing.

**For more information publication number: 174004402**

# ED2000

## series condensate drains

- Removes liquid condensate efficiently
- Saves valuable compressed air
- Protects downstream equipment and processes from condensate damage
- Help protect the environment

Consider the compressed air and energy losses associated with the common types of drain. What appears to be a good purchase could actually turn out to be the most expensive option. For example, a system using a single timed drain, could lose approximately 0.062m$^3$/min (2.18cfm) of air.

Over a full year of continuous operation that equates to approximately 32,798m$^3$ (1,142,669 ft$^3$) of air lost! In energy terms that single drain would use 3,581 KW (4,804 hp) energy per year! Now multiply by every drain of that type in the system.

**For more information publication number: 174004423**

# PNEUDRI

## desiccant dryers

- Highest Quality Air
- Totally stops corrosion and damage
- Low installation costs
- Energy efficient

PNEUDRI cleans and dries compressed air down to -40°C (-40°F) pdp as standard and for critical applications, PNEUDRI can be supplied with a dewpoint of -70°C (-100°F) pdp.

Our award-winning modular design utilises Parker domnick hunter patented technology to provide the ultimate in umcompromising performance, security and reliability for your compressed air system.

For more information publication number: 174004759

# CRD

## refrigeration dryers

- Environmentally friendly R407C refrigerant
- Energy efficient, low running costs
- Suitable for high ambient operating conditions up to 50°C (122°F) and inlet temperatures up to 60°C (140°F)

Remove water from any compressed system economically. Well proven refrigeration principles are at the heart of this reliable and complete product range.

Avoid corrosion, machinery failure and product spoilage. Reduce energy costs and improve productivity by installing a **Parker domnick hunter** refrigeration dryer with OIL-X EVOLUTION filtration.

Modern features include the latest technology ultra-compact modular aluminum cross flow heat exchangers with low differential pressure and energy efficient scroll compressors (most models).

For more information publication number: 174004566

# PCO2

## carbon dioxide polishing filter


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

The Parker domnick hunter PCO2 range of carbon dioxide purifiers will remove harmful contaminants from $CO_2$ used in the manufacture of beverages.

The PCO2 cartridge incorporates a mix of adsorbents that effectively remove the contaminants. The addition of a particulate retention filter, providing protection down to 0.01 micron, completes a package that will ensure $CO_2$ conforms to the quality guidelines for carbon dioxide (published 1999) by the International Society for Beverage Technologists. (ISBT)

The Parker domnick hunter PCO2 Carbon Dioxide Polishing Filter, model: MF-5 is deigned to give point of use protection in draught dispense applications.

For more information publication number: 174004462

# HYPERCHILL

## precision chilled water


- Standard custom designed options provide unrivalled choice
- Wide range of colling capacities
- Minimal space-saving footprint
- Low energy consumption

Hyperchill is the new range of precision water chillers by Hiross. The range covers cooling capacities from 2 to 360 kW. Each model is designed for safe and reliable operation, whatever the working conditions.

Flexibility and an extensive range of options ensure that Hyperchill operates continuously and efficiently whatever the conditions. All models accept water inlet temperatures up to 30°C and water outlet temperatures down to 0°C. Custom-designed alternatives for tower temperature glycol solutions are also available.

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