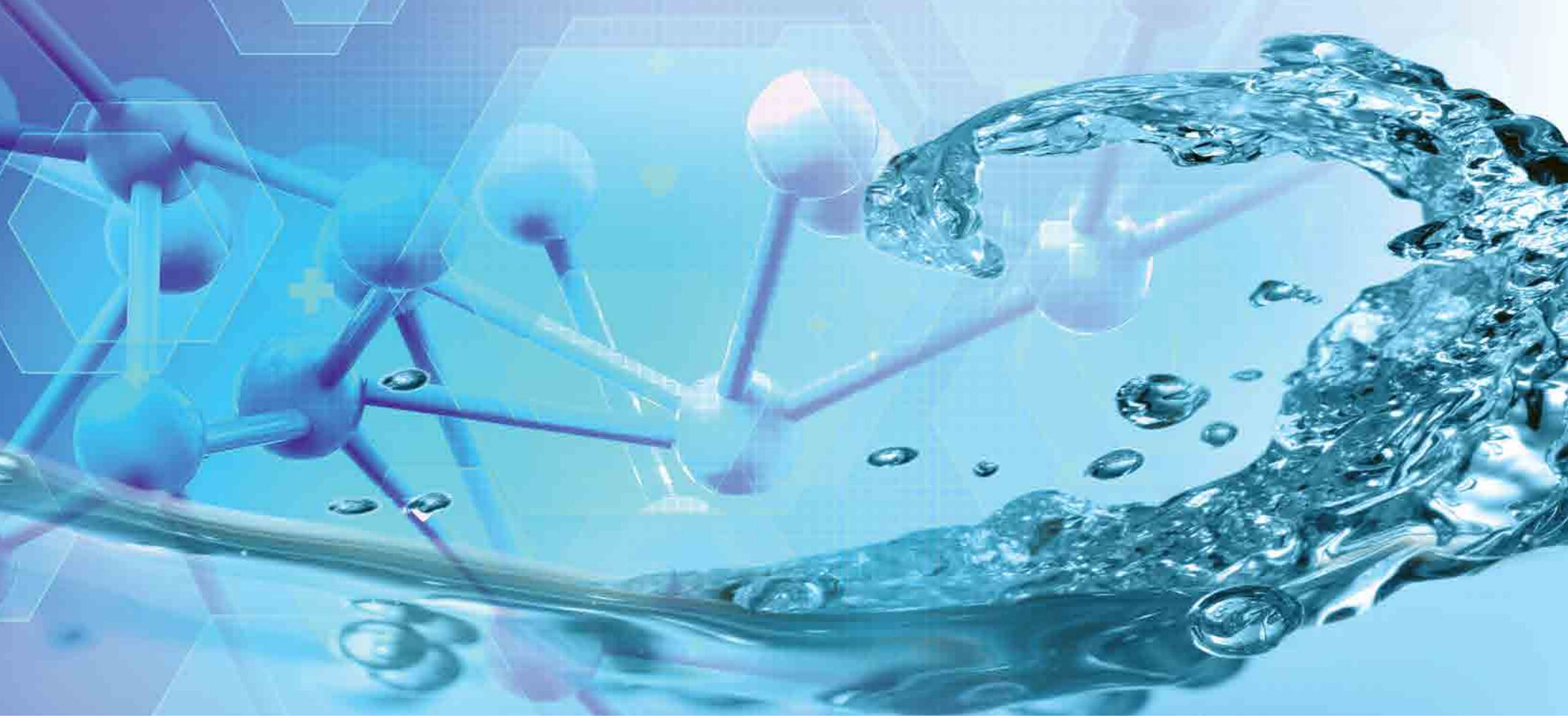


High-Purity Chemicals in Electronic Applications

Training guide for filtration products

NEXT PAGE

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

Parker domnick hunter

ENGINEERING YOUR SUCCESS.

For technical or application support related to our fluid filtration solutions, please call our toll free number **877 784 2234** or email **dhpsales.na@parker.com**

Contents

Introduction

Providing a cost-effective filtration technology that ensures consistent quality and process optimization

High-purity chemicals and materials are essential in manufacturing microelectronics devices that are enabling advances in work, life science, communications, transportation, efficient lighting, entertainment, shopping, and many other areas that affect our lives.

Parker domnick hunter's proven product range and applications experience in the manufacturing of these high-purity chemicals, chemistries, and solvents allows our customers to meet the high-purity requirements that enable constant technical advancement of their customers. While each application is unique, we can often divide high-purity applications into the following broad processes:

- Ultra-pure water is needed to enable production of liquid high-purity chemical, or to dilute concentrated chemical into the concentration required by the customer.
- Specialty chemical-vapor filtration which is unique to polysilicon production.
- Distillation in some processes may be done in a very aggressive, high-temperature environment requiring a special filtration solution.
- Venting of tanks with hydrophobic filters to relieve gas pressure build-up.
- Anhydrous and other industrial liquid raw materials may require filtration from tankers, pipelines, or other large vessels before they are introduced to the high-purity manufacturing system.
- Pre-filtration or clarification through the manufacturing process is typical and necessary to guarantee quality specifications throughout the process.
- Final package filtration is the last particle barrier and the final critical filtration step in the high-purity manufacturing process.

Given the variations of these processes for high-purity chemicals, chemistries, and solvents, it is critical to consider the operating parameters when selecting filtration for each stage of manufacturing.

As our customers require fewer and smaller particles and the need for lower metal extractables increases, it is essential for us to fully understand their applications and process demands. In addition to helping our customers achieve their final specification, we must recommend filtration solutions that minimize process downtime and reduce product waste. The total cost of ownership must be considered without compromising the quality of the end product.

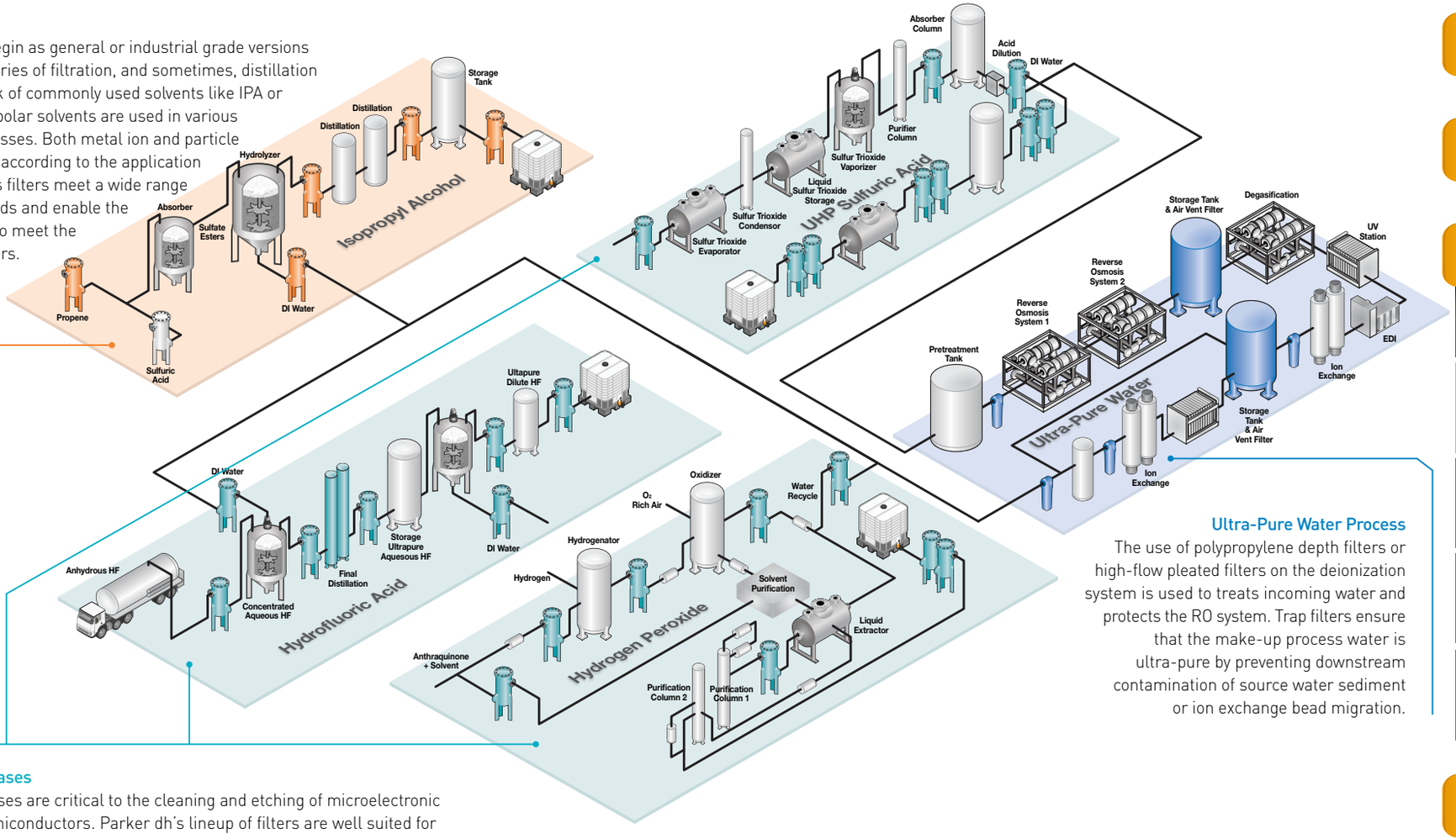
Market Applications

- High-purity concentrated acids
- High-purity acid blends
- High-purity bases
- High-purity alkaline solutions
- High-purity solvents
- Some photoresists and polyimides
- Anti-reflective coatings
- Developers – negative and positive
- Organic solvents used to strip photoresist polymer
- CMP base chemicals – acids or bases
- High-purity plating solutions
- Trichlorosilane – vapor and liquid

High-Purity Chemical Application Overview

High-Purity Solvents

High-purity solvents begin as general or industrial grade versions before undergoing a series of filtration, and sometimes, distillation steps. While most think of commonly used solvents like IPA or acetone, other mostly polar solvents are used in various microelectronics processes. Both metal ion and particle specifications will vary according to the application and customer. Parker's filters meet a wide range of solvent filtration needs and enable the solvent manufacturer to meet the needs of their customers.



Ultra-Pure Water Process

The use of polypropylene depth filters or high-flow pleated filters on the deionization system is used to treats incoming water and protects the RO system. Trap filters ensure that the make-up process water is ultra-pure by preventing downstream contamination of source water sediment or ion exchange bead migration.

High-Purity Acids & Bases

High-purity acids & bases are critical to the cleaning and etching of microelectronic devices, especially semiconductors. Parker dh's lineup of filters are well suited for achieving the challenging particle and ionic specifications the chemical companies need to meet. Filtration is progressive, getting tighter throughout the process. Materials of construction must not only be highly compatible and provide good performance, but must also offer outstanding value. While polypropylene may be compatible in a particular acid or base for one manufacturer, it may not be suitable for another whose end user customers require ultra low metal extractables. Parker can meet the needs of both customers.

For detailed products in each process application, see pages 5 - 9.

Selection Process

Identifying customer needs

In order to meet filtration specifications, physical and chemical conditions of the process have to be considered.

It is therefore essential that a methodical process for identifying the customer's needs is followed.

The SELECT process builds on principles used to select the optimized filtration solution for the high-purity chemical manufacturer.

S — START with the end in mind

- **What is the customer trying to achieve?**
  - Ultra-purewater
  - Pre-filtration to trap and final filters
  - Filtration of raw materials or additives
  - Vapor filtration
  - Distillation of concentrated chemical
  - Venting of tanks
  - Stage pre-filtration
  - Final package filtration
- **What are the target contaminants?**
  - Hard particles
  - Gels
  - Fibers
  - Moisture
  - Metal ions
- **Legislation and environmental**

E — EFFICIENCY

- **What type of filter?**
  - Coarse – bag, etc
  - Depth/pleated
  - Pleated membrane
  - Retention/efficiency
  - Grade of filter media (micron)
  - Single pass
  - Multi pass
  - Support material
  - Media
  - Solids loading

L — LIFE

- **Life to blockage**
  - Life to loading
  - Identify volume/through put (batch size)
  - Flow rates
  - Particle concentration
  - Correlation of pressure drop to particle spec
- **Filter compatibility**
  - Chemical/solvent type and concentration
  - Operating temperature
  - Viscosity

E — ECONOMY

- **Existing housings**
  - Identify housing
  - Determine correct filter code
  - Length/width
- **New housings**
  - Chemical compatibility
  - Operating pressure/ temp
  - Fittings/vents
  - Materials of construction
  - Size–flow rate
- **Operational efficiency**
  - Low downtime
  - Low hold-up volume
  - Disposable costs
- **Product and process safety**
  - Minimize operator exposure to process chemicals

C — COMPETITIVE ADVANTAGE

- **Differentiation through support programs**
  - Operator training
  - Process audits
  - Filter changeout
  - Returned filter analysis
  - Contract testing
- **Parker cross-divisional solutions**
- **Alternative technologies**
  - Custom engineered solutions

T — TECHNICAL SUPPORT

- **Ongoing Support**
  - Contract testing
  - Troubleshooting
  - Technical audits
  - Operator training
  - Validations
  - Product trials
  - Scale-up
- **TSG Support**
  - Experienced and highly qualified scientists
  - Fully equipped labs
- **Regional Support**
- **Divisional Support**

Ultra-Pure Water (UPW)

Ultra-Pure Water (UPW)* is essential in the manufacturing processes of most chemicals, chemical blends, and solvents. Chemical companies with high-purity chemical processes use UPW in the manufacturing process or to control concentrations per their customer's specification.

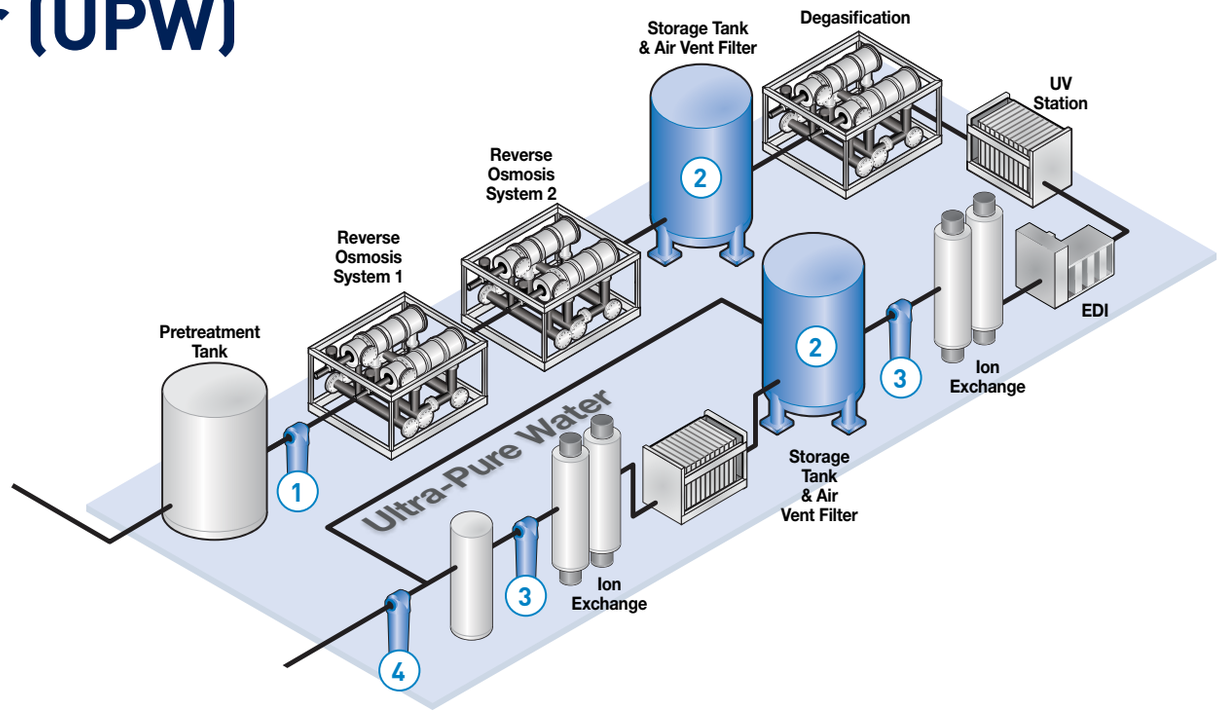
Converting typical city or lake water into UPW requires several steps. Reverse osmosis (RO) is the first major step used to remove contaminants from the mains water. Parker domnick hunter filters are used prior to the RO systems to protect the RO membrane from large particles.

Ion exchange converts the post-RO water to UPW water with a combination of cation and anion resins used to remove positive and negative ions. Filters are used to remove any particles that could come off the ion exchange resin beds.

Final filters may be used for last chance particle capture from the system to ensure the very best UPW quality.

Post RO, most filters used are hydrophilic with a polypropylene structure. It's important to note that some companies may decide to use all-fluoropolymer filters if they use an aggressive line sanitization method, like ozone, to kill any bacteria in the line.

*UPW refers to ultra-pure deionized water used in Microelectronics manufacturing



Core Filter(s)	Location	Purpose	Features	Benefits	Advantages
Abso-Mate	1	Incoming mains water & pre-RO	Polypropylene depth media	Capture large particles in raw materials	Protection of reverse osmosis system
Poly-Mate					
Poly-Mate Plus					
Polyflow					
Polyflow-G					
Proflow II-E	2	Storage tank air vent	Hydrophobic PTFE membrane	Venting of air	Prevent unwanted pressure buildup
Proflow II-E Select					
Clariflow-WE	3	Post ion exchange resin capture	Hydrophilic PES membrane (no wetting needed)	Capture fine particles coming off ion exchange beds	Protect downstream equipment and added process
Clariflow-E					
Clariflow-E Select					
Clariflow-E	4	Final filtration step	Hydrophilic PES membrane (no wetting needed)	Tightest particle removal to meet UPW standards	Final filtration step to help meet final particle specification
Clariflow-E Select					

High-Purity Solvents

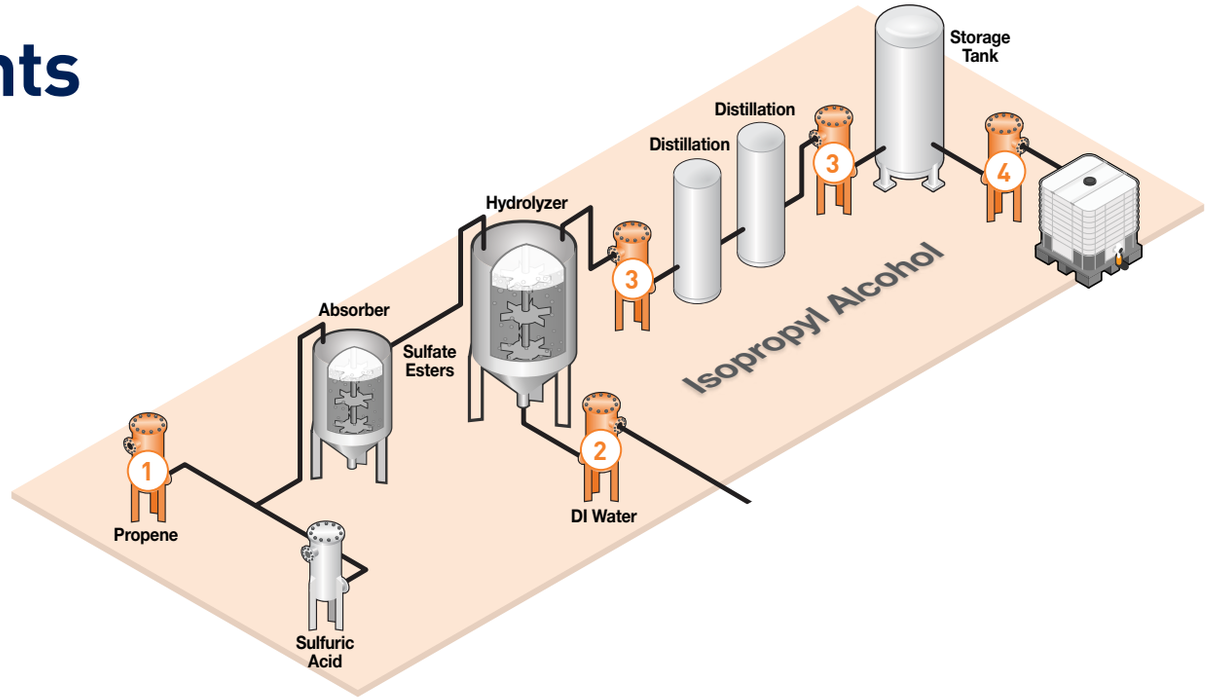
Isopropyl Alcohol (IPA)

Isopropyl Alcohol (IPA) is the most common solvent used in semiconductor manufacturing. It may be used to rinse wafers in certain processes where water contact is not desirable. IPA is also used to dry wafers and other Microelectronics devices since it will not streak or leave watermarks. While there are different methods of manufacturing IPA, a common one is through the combination of propene and sulfuric acid to create sulfate esters. Parker melt blown and pleated depth filters may be used to filter these raw materials.

The hydrolization process combines the sulfate esters and Ultra-Pure Water (UPW). A hydrophilic filter may be used to filter incoming UPW. As the newly created IPA leaves the hydrolyzer, it may pass through filtration prior to other process steps including distillation.

The number of distillation steps will depend on the level of purity required. Though not shown here, some manufacturers may use filters during or between distillation steps. Following distillation, a series of filtration steps may be used to further reduce inline particle size and quantity.

Final package filtration is a last chance particle removal step. This is typically where inline particle counters will be used to monitor particle size and quantity. Here, filters will be tighter than upstream filters in the manufacturing process. Micron rating will depend on the end user particle specification.



Core Filter(s)	Location	Purpose	Features	Benefits	Advantages
Abso-Mate	1	Incoming raw materials	Polypropylene depth media	Capture large particles in raw materials	Protection of absorption process
Poly-Mate					
Poly-Mate Plus					
Polyflow					
Polyflow-G					
Clariflow-WE	2	DI water	Hydrophilic PES membrane	Removal of particles in UPW down to 0.02 microns	Provide consistent source of UPW to hydrolyzer
Clariflow-E					
Clariflow-E Select					
Chemflow-PE	3	Pre and post distillation	PTFE membrane on either HDPE or PP support structure	Fine particle removal	Protect and enhance distillation process
Chemflow-PE Select					
Proflow II-E					
Proflow II-E Select					
Chemflow-PE	4	Final package	PTFE membrane on either HDPE or PP support structure	Fine particle removal	Final filtration step to help meet final product particle specification
Chemflow-PE Select					
Proflow II-E					
Proflow II-E Select					

High-Purity Acids & Bases

Hydrofluoric Acid

High-purity hydrofluoric (HF) acid begins with the mixing and chemical interaction of sulfuric acid and dry fluorspar (CF2). The result of mixing those in a rotary kiln is HF gas. The HF gas is condensed then distilled to form anhydrous hydrofluoric acid.

In this diagram, the industrial anhydrous HF is delivered via tanker or pipeline to become ultra-pure HF commonly used in semiconductor wafer etch and clean processes. Parker domnick hunter membrane filters with either HDPE or PFA structures may be used throughout the manufacturing process.

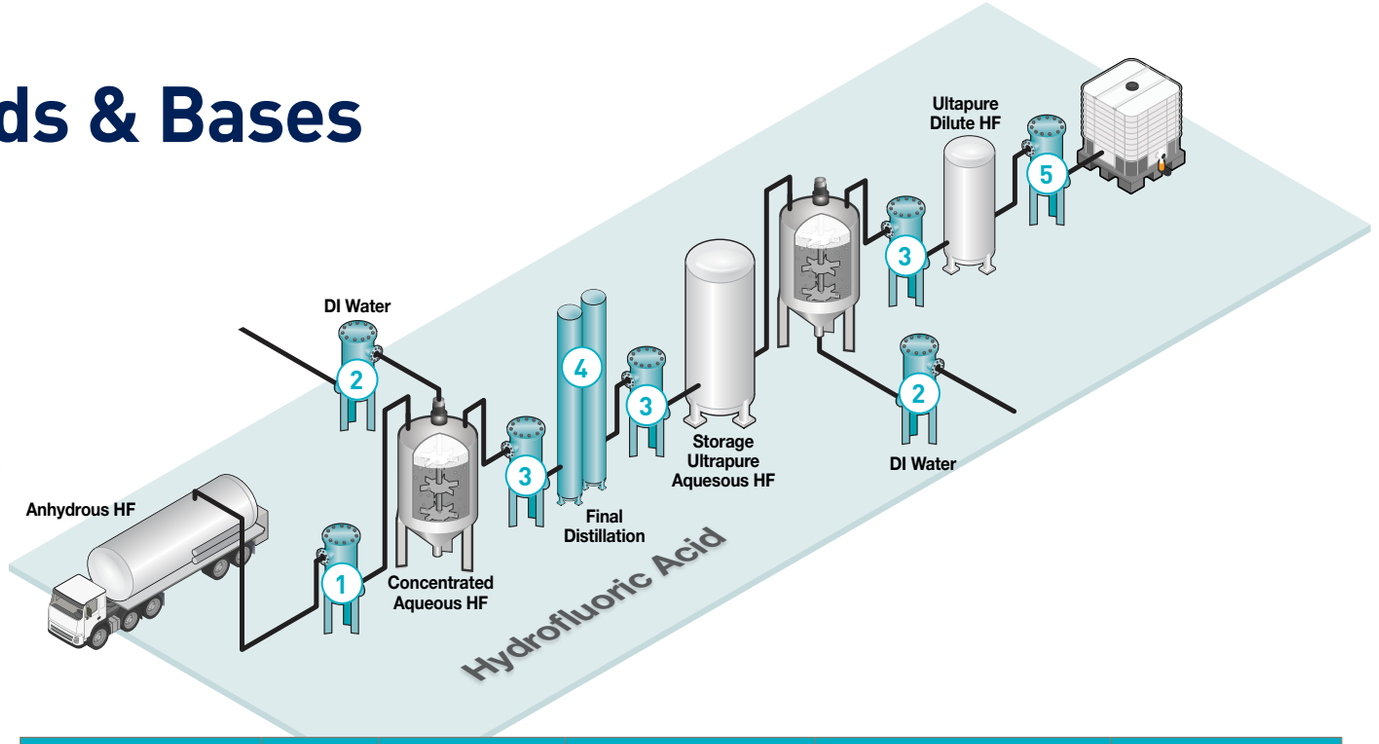
Distillation is an important step in producing ultra-pure hydrofluoric acid. The aggressive nature of the acid combined with temperatures high enough to vaporize the HF make this a challenging filter application. For that reason, only 100% fluoropolymer filters can be used.

The HF vapor can pass through the PTFE membrane, then re-condense in to a purer form with ultra low contaminants. As the ultra-pure concentrated HF exits the distillation process, a filtration step to remove additional particles may be present.

From here, the ultra-pure concentrated HF may be blended with ultra-pure water to various desired concentrations.

Parker domnick hunter filters ensure process consistency and enable the HF manufacturer to meet the final particle specification for their end user customers.

It's important to note that while polypropylene filters, like Parker's Proflow-II-E, could be used in dilute HF, both HDPE and PFA are considered to be more chemically robust and would typically be recommended.



Core Filter(s)	Location	Purpose	Features	Benefits	Advantages
Chemflow-PE	1	Optional Incoming raw materials	PTFE membrane on either HDPE or PFA support structure	More open ratings to capture large particles in raw materials	Process particle control
Chemflow-PE Select					
Fluoroflow					
Fluoroflow-HSA					
Clariflow-WE	2	DI water	Hydrophilic PES membrane	Removal of particles in UPW down to 0.02 microns	Provide consistent source of DIW to hydrolyzer
Clariflow-E					
Clariflow-E Select					
Chemflow-PE	3	Stage/ pre-filtration/ blending	PTFE membrane on either HDPE or PFA support structure	Fine particle removal	Process particle control
Chemflow-PE Select					
Fluoroflow					
Fluoroflow-HSA					
Fluoroflow	4	High temp acid distillation	100% fluoropolymer construction	Temperature rating up to 180C	Coalesce water and particle removal
Fluoroflow-HSA					
Chemflow-PE	5	Fine particle removal	PTFE membrane on either HDPE or PP support	Fine particle removal	Final filtration step to help meet final
Chemflow-PE Select					
Fluoroflow					
Fluoroflow-HSA					

High-Purity Acids & Bases

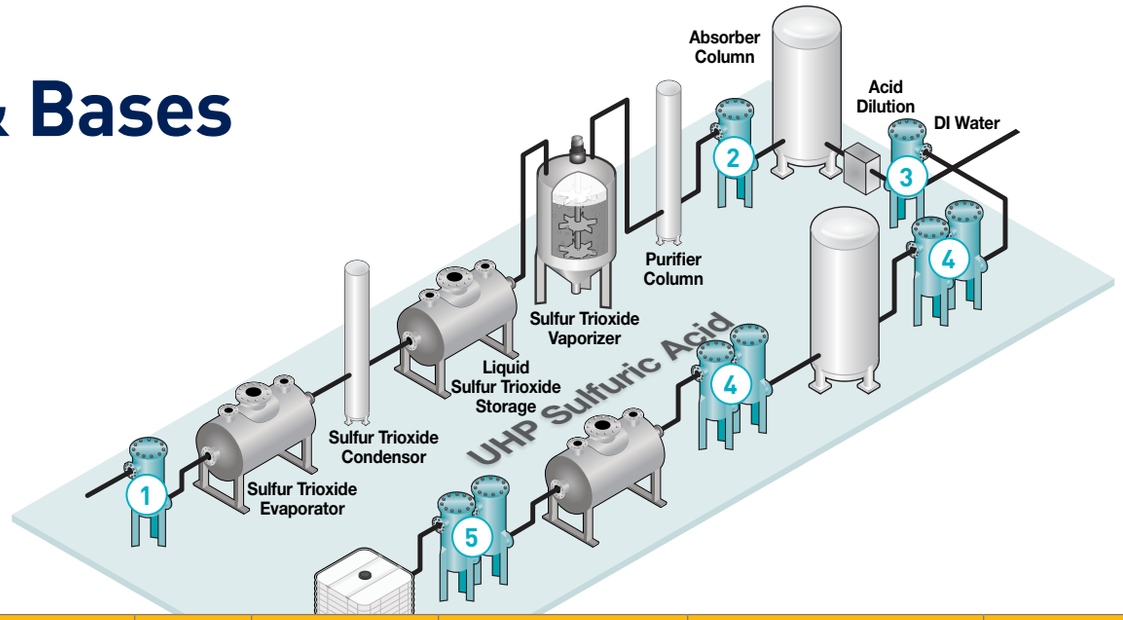
Sulfuric Acid

Sulfuric acid is highly used with either hydrogen peroxide or ozonated UPW to create an intended exothermic reaction. The added energy to this aggressive acid is ideal for removing hard-baked photoresists and most organic contaminants from the surface of silicon production wafers.

A common method of creating sulfuric acid begins by mixing oleum and steam to produce sulfur trioxide vapor. Filters may be used to remove large particles and provide protection to the evaporator.

The SO3 is condensed then vaporized again just before entering a series of purifier columns. The number of purifiers will depend on the H2SO4 specification. Exiting the absorber column is pure concentrated sulfuric acid.

The pure concentrated acid is cooled and carefully diluted into usable concentrations. From there, the acid goes through a series of membrane filtration steps, each succeeding step tighter than the previous until particle specifications are met and the product is packaged for the end user.



Core Filter(s)	Location	Purpose	Features	Benefits	Advantages
Fluoroflow	1	Steam filter	100% fluoropolymer construction	Temperature rating up to 180C	Protection of absorption process
Fluoroflow-HSA					
Fluoroflow-HSA	2	High temperature acid vaporization	100% fluoropolymer construction	Temperature rating up to 180C	Protect and enhance distillation process
Fluoroflow-Select					
Fluoroflow-XL					
Clariflow-WE	3	DI water	Hydrophilic PES membrane	Removal of particles in UPW down to 0.02 microns	Provide consistent source of UPW
Clariflow-E					
Clariflow-E Select					
Chemflow-PE	4	Stage/ pre-filtration/ blending	PTFE membrane on either HDPE,PFA or PP support structure	Fine particle removal	Process particle control
Chemflow-PE Select					
Proflow II-E					
Proflow II-E Select					
Fluoroflow-HSA					
Fluoroflow-Select					
Chemflow-PE	5	Final package	PTFE membrane on either HDPE, PFA or PP support structure	Fine particle removal	Final filtration step to help meet final product particle specification
Chemflow-PE Select					
Proflow II-E					
Proflow II-E Select					
Fluoroflow-HSA					
Fluoroflow-Select					

High-Purity Acids & Bases

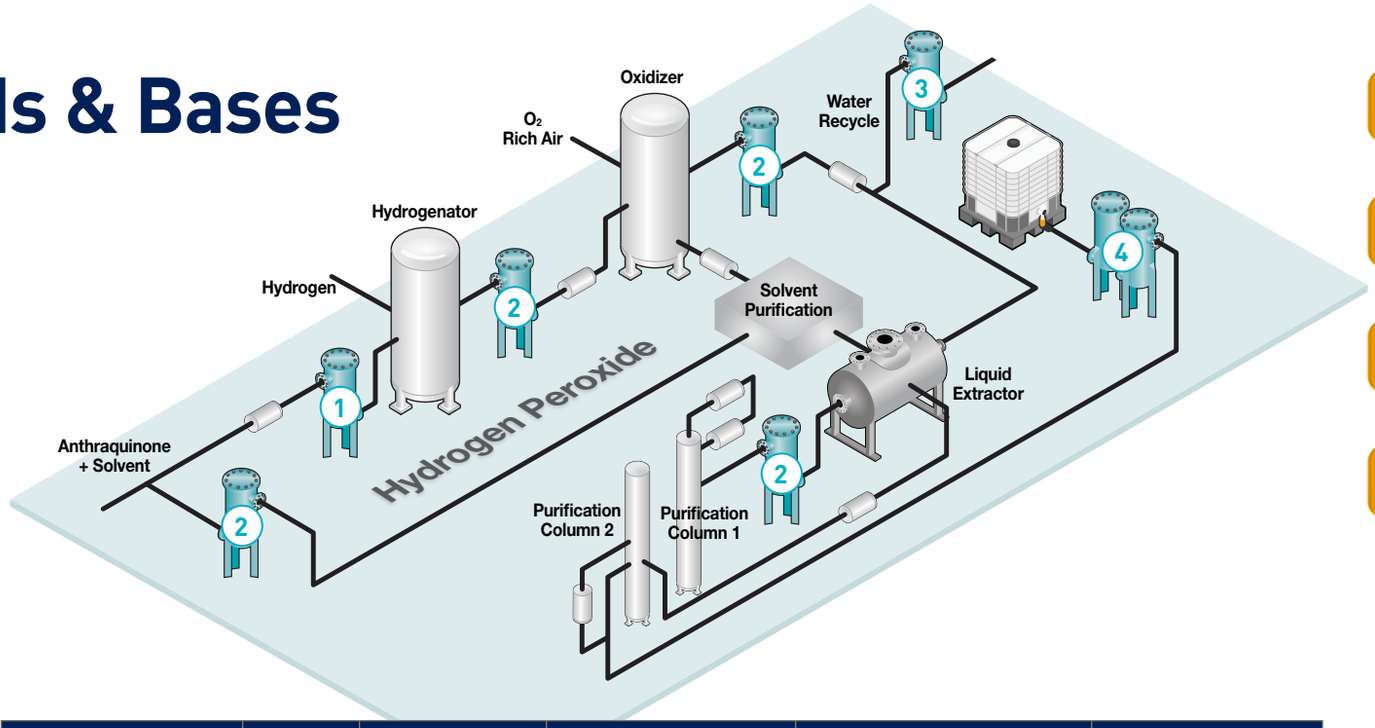
Hydrogen Peroxide

Hydrogen peroxide is made in a series of steps. A hydrocarbon-based "work-solution" is fed to the hydrogenator along with a stream of hydrogen where hydrogenation occurs over a bed of Ni or Pd catalysts.

The first filtration step is used to capture catalyst particles from the hydrogenated fluid.

In the oxidizer, oxygen-rich air is introduced to the work solution to reverse the previous reaction. The resulting work-solution contains about 40% H_2O_2 by weight as it goes into the liquid extractor. Water is fed into the extractor and since the H_2O_2 is miscible in water while the solvent is not, the water-peroxide layer can be removed and sent to the purification columns.

In the purification columns, the water-peroxide mixture is further concentrated and purified. For UHP hydrogen peroxide, multiple columns may be used.



Core Filter(s)	Location	Purpose	Features	Benefits	Advantages
Abso-Mate	1	Incoming raw materials	Polypropylene depth media	Capture large particles in raw materials	Protection of evaporator
Poly-Mate					
Poly-Mate Plus					
Polyflow					
Polyflow-G					
Chemflow-PE	2	Stage/ pre-filtration/ blending	PTFE membrane on either HDPE or PP support structure	Fine particle removal	Process particle control
Chemflow-PE Select					
Proflow II-E					
Proflow II-E Select					
Clariflow-WE	3	DI water	Hydrophilic PES membrane	Removal of particles in UPW down to 0.02 microns	Provide consistent source of UPW to liquid reactor
Clariflow-E					
Clariflow-E Select					
Chemflow-PE	4	Final Package	PTFE membrane on either HDPE, PP or PFA support structure	Fine particle removal	Final filtration step to help meet product specifications
Chemflow-PE Select					
Proflow II-E					
Proflow II-E Select					
Fluoroflow					

Services

Technical Support Group (TSG)

In these industries, manufacturers and end-users face stringent environmental and operational compliances, where the trend is to ensure low Volatile Organic Compounds (VOC) exposure and spillage of hazardous waste while providing a more user friendly process environment. Combined with the market demands for high quality products, this means that the raw materials and chemistries used in formulations result in higher manufacturing costs.

Parker domnick hunter is committed to providing comprehensive technical support of our products through our global sales network and dedicated technical support group. Our team of trained scientists, engineers and technicians is available to answer questions on the capabilities of our products, assist customers to select, specify and design filtration systems to meet specific user requirements, and provide a range of advisory and troubleshooting services.

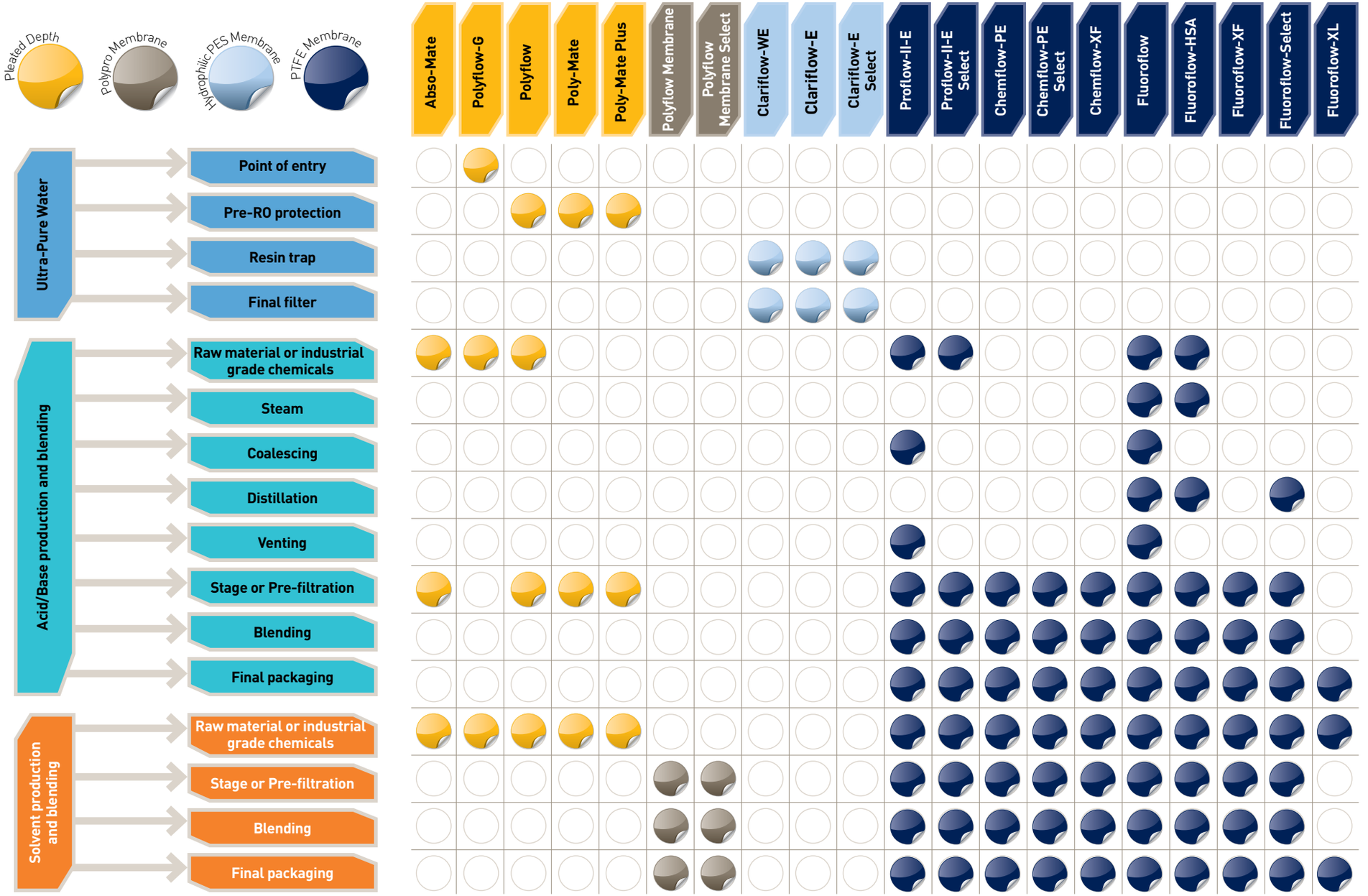
We provide technical support to assist in training operators on a wide range of activities related to using our products, system sizing and performance optimization.

Results can be utilized to manipulate pre and final filter trains to achieve the desired throughput and quality without over processing.

Services Overview

Laser particle size analysis	Quantitative particle counting can give an indication of the expected workload of a filter system. This can identify the need for prefiltration or the use of an alternative technology.
Particulate analysis	Identification of the particulate loading within a process fluid or the analysis of filtrate through various filtration grades and materials can identify the optimum filtration system. Specific particulates can also be identified through light microscopy and SEM to establish the contaminant source.
Advanced analytical analysis	Energy-dispersive X-ray spectroscopy (EDS/EDX) and Fourier Transfer infra red (FTIR) spectroscopy can be conducted to characterize retained materials on a filter media, aiding in identification of the source of blockage material. Identification of metal ion extractables can be done with Inductively coupled plasma mass spectrometry (ICP-MS).
Filterability index analysis	Small-scale trials can be conducted with sample volumes of product under controlled laboratory or process conditions. This method is used to determine the optimum multi-stage filter system or determine the filter size required for a process batch or a continuous process. This allows the system to be specifically sized and designed to give optimum economies in both hardware installation and replacement element cost.
Existing system optimization	Where a process is altered through increased operational demand, for example through extension of a production campaign, higher production volumes or an increased number of product changes, Parker domnick hunter offers support to ensure the system remains appropriate for these changed process demands.
Fault diagnosis	Often filtration is a critical step or control point within a process, therefore, when finished product quality is not achieved the filter is often the first point of call. The Parker domnick hunter TSG group can provide a reactive service to enable rapid 'root cause' analysis and assist in minimizing the risk of recurrence.

High-Purity Chemicals Selection Matrix



PTFE Membrane Filter Cartridges

Chemflow®-PE

- Good flow rates
- Good lifetime
- Wet-pack option for quick installation
- PTFE/HDPE construction for chemical resistance
- 100% integrity tested in cleanroom environment

Chemflow-PE provides a low metals, economical alternative to all-fluoropolymer cartridges. Ideally suited for final packaging of high-purity chemicals and solvents and most lower temperature chemical delivery and wet process (<60°C) applications.

Chemflow®-PE Select

- High flow rates
- Long lifetime
- Wet-pack option for quick installation
- PTFE/HDPE construction for chemical resistance
- 100% integrity tested in cleanroom environment

The addition of the SELECT pleat technology provides a high-flow, low metals, and economical alternative to all-fluoropolymer high surface area cartridges. Ideally suited for final packaging of high-purity chemicals and solvents and many low temperature chemical delivery and wet process (<60°C) applications.

Chemflow®-XF

- Highest flow rates in the industry for a 2.75" wide cartridge
- Long lifetime
- Wet-pack option for quick installation
- PTFE/HDPE construction for chemical resistance
- 100% integrity tested in cleanroom environment

The asymmetric PTFE membrane provides unmatched flow rates and on-stream life to help improve throughput and reduce filtration costs. Ideally suited for final packaging of high-purity chemicals and solvents and many low temperature chemical delivery and wet process (<60°C) applications.

Fluoroflow®

- Economical all-fluoropolymer cartridge
- High particle retention
- Wet-pack option for quick installation
- All-fluoropolymer for maximum chemical resistance
- 100% integrity tested in cleanroom environment

Fluoroflow is an economical all-fluoropolymer solution for low to medium flow high purity chemical applications that require the highest chemical resistance. This filter is ideally suited for nearly all high-purity chemical and solvent manufacturing applications including those requiring a high temperature rating (150°C).

Fluoroflow®-HSA

- Increased filtration area for longer life
- High particle retention
- Wet-pack option for quick installation
- All-fluoropolymer for most maximum chemical resistance
- 100% integrity tested in cleanroom environment

This cartridge is a high surface area all-fluoropolymer solution for medium flow high purity chemical applications that require the highest chemical resistance and desire longer life. This filter is ideally suited for nearly all high-purity chemical and solvent manufacturing applications including those requiring a high temperature rating (150°C).

Fluoroflow® Select

- Highest filtration area in a 2.75" width cartridge
- High flow rates for increased bath turn over
- Wet-pack option for quick installation
- All-fluoropolymer for maximum chemical resistance
- 100% integrity tested in cleanroom environment

The addition of the SELECT pleat technology increases filtration area and flow rate by over 70% versus our standard Fluoroflow to achieve the highest flow and longest filter life available in a 2.75" width cartridge. The all-fluoropolymer construction provides highly efficient particle removal, excellent chemical resistance, and very low metal extractables.

Fluoroflow®-XF

- Highest flow rates in the industry for a 2.75" wide cartridge
- High flux asymmetric PTFE membrane rates for increased flow
- Wet-pack option for quick installation
- All-fluoropolymer for maximum chemical resistance
- 100% integrity tested in cleanroom environment

This cartridge provides excellent flow and chemical resistance for the most aggressive applications up to 150 °C. Fluoroflow-XF is ideally suited for high-purity chemical manufacturing processes and recirculated clean, etch, or plating applications where particle removal efficiency is improved with high bath turnover.

Fluoroflow®-XL

- Extra-high filtration area in a 3.25" wide cartridge
- Highest flow rates for maximum bath turn over
- Wet-pack option for quick installation
- Ultraclean option for absolute cleanliness
- 100% integrity tested in cleanroom environment

Uses a larger diameter cartridge (3.25") combined with our unique SELECT pleating technology to achieve our highest surface area, highest-flow all-fluoropolymer filter. Fluoroflow-XL is ideal for high-loading, aggressive, high-purity processes where performance is dependent on high flow, efficient particle removal, and ultra-low metal extractables.

Proflow™ II-E

- Economical, high-purity chemical and solvent filtration
- Good liquid and gas flow rates
- Wet-pack option for quick installation
- PTFE/ PP construction for high chemical resistance
- 100% integrity tested in cleanroom environment

Proflow-II-E uses a PTFE membrane with high purity polypropylene supports to provide an economical yet high-purity filtration solution for high-purity chemical, solvent and gas applications. This filter is ideal for many high-purity chemical and solvent manufacturing applications.

Proflow™ II-E Select

- Economical, high-purity chemical and solvent filtration
- High surface-area SELECT pleating for excellent liquid flow rates
- Wet-pack option for quick installation
- PTFE/ PP construction for chemical resistance
- 100% integrity tested in cleanroom environment

An economical, yet high-performance filter cartridge for high-purity chemical and solvent applications, the Proflow II-E Select uses a PTFE membrane along with polypropylene supports. With SELECT pleating, liquid flow rates are increased by up to 50% verses our standard Proflow II-E.

Pleated Depth Filter Cartridges

Abso-Mate®

- Non-fiber releasing and low extractables
- Single-piece construction eliminates bypass concerns
- All-polypropylene construction offers wide chemical compatibility with most chemicals
- Absolute rated for consistent and reliable performance (99.98%)

Cost-effective and absolute rated for capturing particles 0.2 to 70 µm in size. This pleated melt blown cartridge is of all-polypropylene construction, and without adhesives that could potentially contaminate fluids.

Polyflow®

- High-retention depth matrix for economical prefiltration
- High flow rate and long service life reduce processing time
- Wide variety of configurations and ratings
- Broad chemical compatibility allows use in most applications
- Thermally bonded virgin polypropylene construction minimizes extractables

Thermally bonded, absolute rated 100% virgin polypropylene to provide absolute filtration cartridge features a random-fiber polypropylene depth matrix to provide excellent retention efficiencies. Ideally suited for most high-purity chemical and solvent pre-filtration applications.

Polyflow®-G

- Depth matrix for economical prefiltration
- High flow rate and long service life reduce processing time
- Wide variety of configurations and ratings
- Broad chemical compatibility allows use in most applications
- Thermally bonded virgin polypropylene construction minimizes extractables

These nominal-rated depth filter cartridges are thermally bonded from 100% virgin polypropylene. Polyflow-G's high dirt-loading, random-fiber polypropylene depth media provides consistent particle retention and protection of upstream filters.

Fulflo® Poly-Mate™

- All Polypropylene construction maximizes chemical resistance
- Pleated surface area offers extended service life, low pressure drop and high flow capacity
- One-piece, continuous to 40 inches length, integrally sealed pleated filter media
- Non-fiber releasing polypropylene construction

A unique combination of polypropylene melt blown and spun-bonded pleated media provides retention ratings of 0.5 to 60 µm at 99% efficiency.

Fulflo® Poly-Mate™ Plus

- Fixed pore construction provides ultimate particle retention
- Offers high flow rates and extended service life
- Non-fiber releasing enabling consistent quality filtration performance
- One piece integral construction for maximum cartridge integrity

A unique combination of polypropylene melt blown and spun-bonded pleated media provides high surface area at retention ratings of 0.25 to 100 µm at 90% efficiency.

Polypropylene Membrane Filter Cartridges

Polyflow® Membrane

- Highly-retentive polypropylene membrane
- Wide range of configurations and ratings
- Wet-pack option for quick installation
- 100% thermally welded virgin polypropylene construction
- 100% integrity tested in cleanroom environment

This all-polypropylene filter cartridge is optimized for use in certain electronics applications such as the manufacturing of high-purity solvents and most G or I-line photoresists. Every cartridge is fabricated in a clean room environment, pre-flushed with 18 megohm-cm ultrapure DI water, and 100% integrity tested.

Polyflow® Membrane Select

- Highly-retentive polypropylene membrane
- Unique SELECT pleating technology for higher flow and longer life
- Wet-pack option for quick installation
- 100% thermally welded virgin polypropylene construction
- 100% integrity tested in cleanroom environment

Polyflow-Membrane-Select is a higher surface area, all-polypropylene filter cartridge ideal for use in certain electronics applications such as the manufacturing of high-purity solvents and most G or I-line photo resists. Every cartridge is fabricated in a clean room environment, pre-flushed with 18 megohm-cm ultrapure DI water, and 100% integrity tested.

Hydrophilic PES Membrane Filter Cartridges

Clariflow®-E

- High-retention hydrophilic PES membrane
- Good flow rate
- DI water and dilute acids and bases
- Rating down to 0.02 microns
- 100% integrity tested in cleanroom environment

Clariflow-E filter cartridges are optimized for semiconductor DI water and dilute aqueous-based chemicals. A mirrored-anisotropic hydrophilic PES (Polyethersulfone) membrane allows for quick and convenient startup without the need for pre-wetting.

Clariflow®-E Select

- High-retention hydrophilic PES membrane
- Unique SELECT pleating technology for high flow rate and increased life
- DI water and dilute acids and bases
- Rating down to 0.02 microns
- 100% integrity tested in cleanroom environment

Clariflow-E-SELECT filter cartridges are optimized for high-flow microelectronics DI water and dilute aqueous-based chemical microelectronics applications. The SELECT pleated, mirrored-anisotropic hydrophilic PES (Polyethersulfone) membrane enables quick and convenient startup without the need for pre-wetting.

Clariflow®-WE

- Economical filtration
- High-retention hydrophilic PES membrane
- DI water and dilute acids and bases
- Rating down to 0.04 microns
- 100% integrity tested in cleanroom environment

Clariflow-WE filter cartridges are an economical option for filtering DI water filtration and other dilute aqueous solutions. The filter features a hydrophilic PES membrane and all polypropylene support structure for cost efficient and convenient filtration.

Worldwide Filtration Manufacturing Locations

North America

Compressed Air Treatment

Gas Separation & Filtration Division
Airtek/Finite/domnick hunter/Zander
Lancaster, NY
716 686 6400
www.parker.com/faf

Balston
Haverhill, MA
978 858 0505
www.parker.com/balston

Engine Filtration

Racor
Modesto, CA
209 521 7860
www.parker.com/racor

Holly Springs, MS
662 252 2656
www.parker.com/racor

Hydraulic Filtration

Hydraulic & Fuel Filtration
Metamora, OH
419 644 4311
www.parker.com/hydraulicfilter

Laval, QC Canada
450 629 9594
www.parkerfarr.com

Velcon
Colorado Springs, CO
719 531 5855
www.velcon.com

Process Filtration

domnick hunter Process Filtration
SciLog
Oxnard, CA
805 604 3400
www.parker.com/processfiltration

Water Purification

Village Marine, Sea Recovery, Horizon Reverse Osmosis
Carson, CA
310 637 3400
www.parker.com/watermakers

Europe

Compressed Air Treatment

domnick hunter Filtration & Separation
Gateshead, England
+44 (0) 191 402 9000
www.parker.com/dhfns

Parker Gas Separations
Etten-Leur, Netherlands
+31 76 508 5300
www.parker.com/dhfns

Hiross Zander
Essen, Germany
+49 2054 9340
www.parker.com/hzfd

Padova, Italy
+39 049 9712 111
www.parker.com/hzfd

Engine Filtration & Water Purification

Racor
Dewsbury, England
+44 (0) 1924 487 000
www.parker.com/rfde

Racor Research & Development
Stuttgart, Germany
+49 (0)711 7071 290-10

Hydraulic Filtration

Hydraulic Filter
Arnhem, Holland
+31 26 3760376
www.parker.com/hfde

Urjala, Finland
+358 20 753 2500

Condition Monitoring

Parker Kittiwake
West Sussex, England
+44 (0) 1903 731 470
www.kittiwake.com

Process Filtration

domnick hunter Process Filtration
Parker Twin Filter BV

Birtley, England
+44 (0) 191 410 5121
www.parker.com/processfiltration

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Castle Hill, Australia
+61 2 9634 7777
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www.parker.com/china

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www.parker.com/india

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+91 80 2783 6794
www.johnfowlerindia.com

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www.parker.com/korea

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www.parker.com/singapore

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+66 2186 7000
www.parker.com/thailand

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+55 12 4009 3500
www.parker.com/br

Pan American Division
Miami, FL
305 470 8800
www.parker.com/panam

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