

PROCESS FILTRATION SOLUTIONS FOR WATER FILTRATION APPLICATIONS

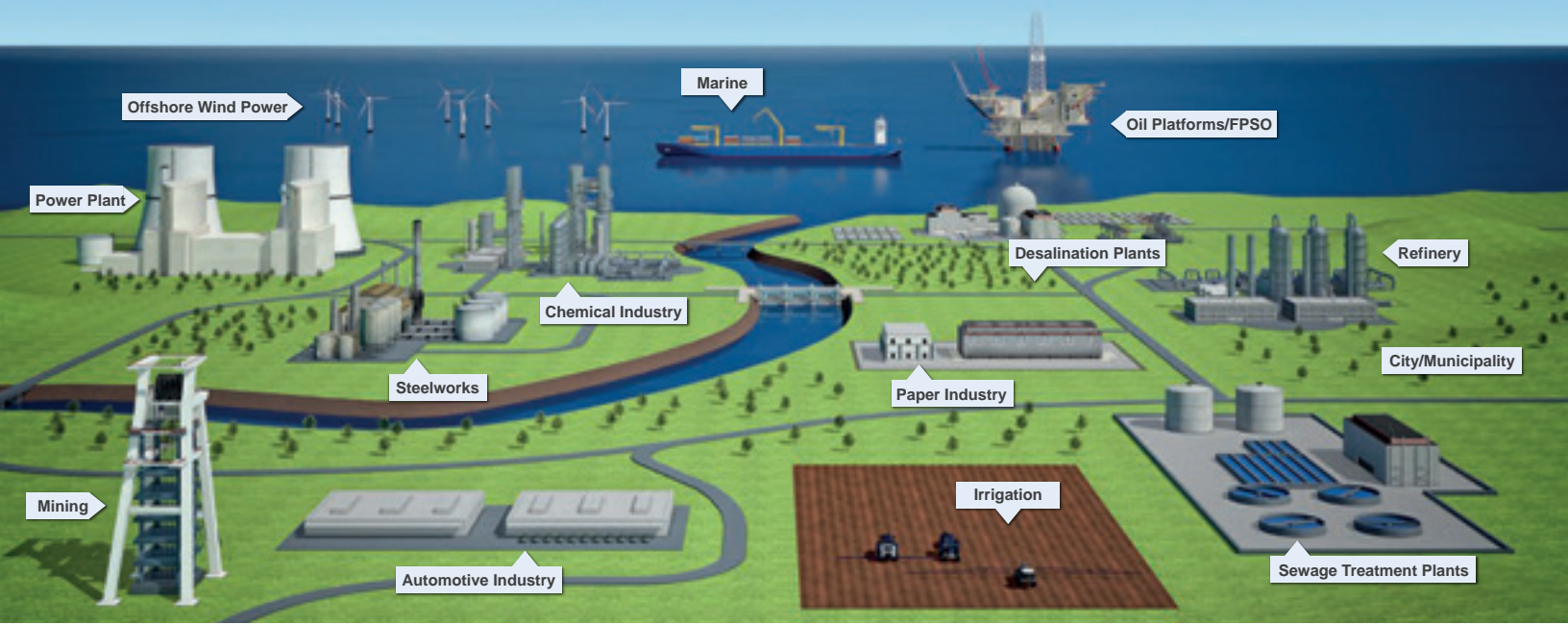


Schroeder
INDUSTRIES
Advanced Fluid Conditioning Solutions®

This page is intentionally left blank

Solutions for Water Filtration in Different Applications	4
Reduce Operating Costs with Schroeder Filter Solutions	5
Schroeder Water Filtration – Work Areas and Fineness	6
Section 1: Coarse Filtration ($\geq 200 \mu\text{m}$)	
PRFS/PRFSD Screen Basket Filter	8
AutoFilt® ATF TwistFlow Strainer	9
Section 2: Fine Filtration (200-25 μm)	
AutoFilt® RF4W	11
AutoFilt® RF3 / RF5 / RF7	12
AutoFilt® RF10	15
AutoFilt® RF14	16
Section 3: Ultrafine Filtration (25–1 μm)	
PLF1 Inline Filter	18
PLF2 Inline Filter	19
Processmicron® Filter Elements PLF1/PLF2	20
PRMF Candle Filters	21

Solutions for Water Filtration in Different Applications



Every Drop Counts

Our “blue planet” will only remain as such if its life sustaining water resources do not dry up.

The use of modern filter technologies allows for the more efficient use and reprocessing of water resources, contributing to the conservation of the earth's water resources.

Benefits of Quality Water Filtration

- Energy Efficiency
- Conservation of Resources
- Process Reliability
- System Availability

Schroeder Water Filtration Solutions

Schroeder Industries offers a variety of process filters suited for efficient filtration across a wide range of applications including:

- Process water
- Membrane feed water
- Scrubber water
- Cooling water
- Service water
- Sealing water
- Injection water
- Ballast water
- Water spray

Reduce Operating Costs with Schroeder Filter Solutions

Poor Pre-filtration Can Be Expensive and Damaging

Challenges

Particulate contaminants can cause damage to membrane filters:

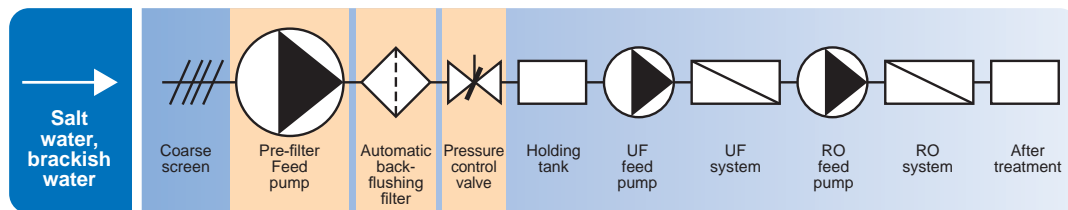
- Damaged membranes increase the risk of contamination reaching the clean water side
- Results in expensive maintenance and repair work as well as downtime
- When using conventional automatic filters, a relatively large pre-filter pump system is required

Membrane Filtration

In the area of water treatment, various pressure-driven membrane processes are employed. The smallest particles (retentate) are retained and removed by a membrane. These processes include:

- Micro filtration
- Ultra filtration
- Nano-filtration
- Reverse osmosis

Automatic pre-filtration – AutoFilt® RF10 with innovative filter technology reduces the costs of pump system pre-filters

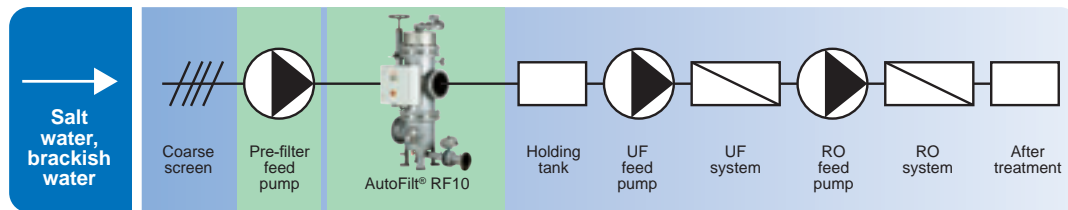


Cost driver:

- Pre-filter pump installations must have large enough dimensions
- Additional control devices for setting the required filtrate pressure of 1.5 bar

Schroeder solution: AutoFilt® RF10

- Highly efficient back-flushing under low pressure conditions and with long back-flushing line



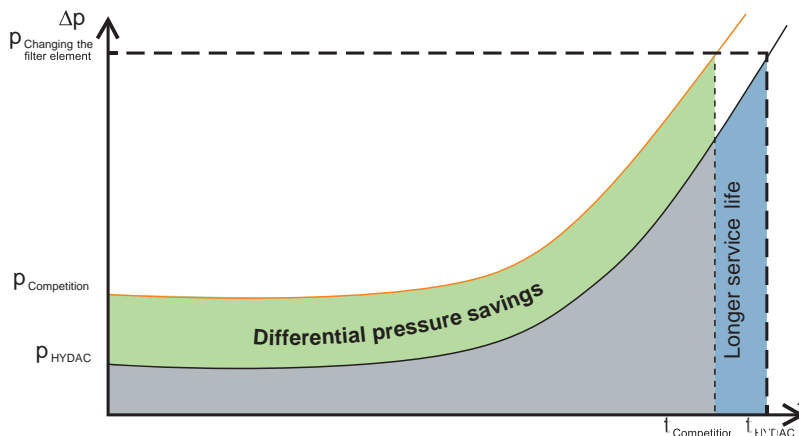
Finest filtration – the process line filters PLF1 and PLF2 ensure a reduced differential pressure and longer service life

Longer Service Life

Thanks to our high quality filter elements, you benefit from optimal filtration and a longer filter element service life.

Energy Cost Savings

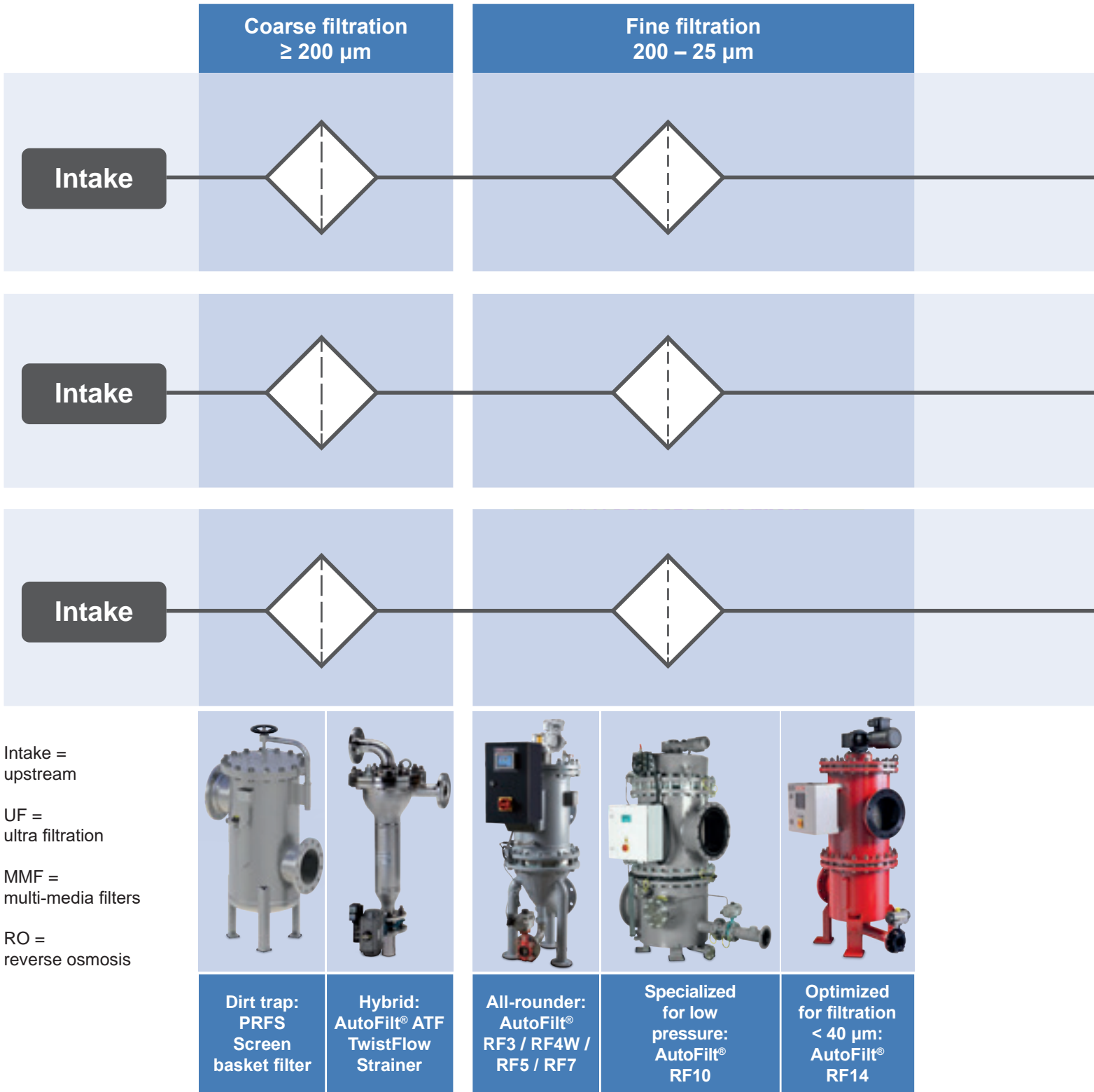
Our filter elements enable very low differential pressure. Differential pressure savings of just 0.49 bar can produce energy savings of up to €42k, depending on the flow rate.



Water Filtration – Work Areas and Fineness

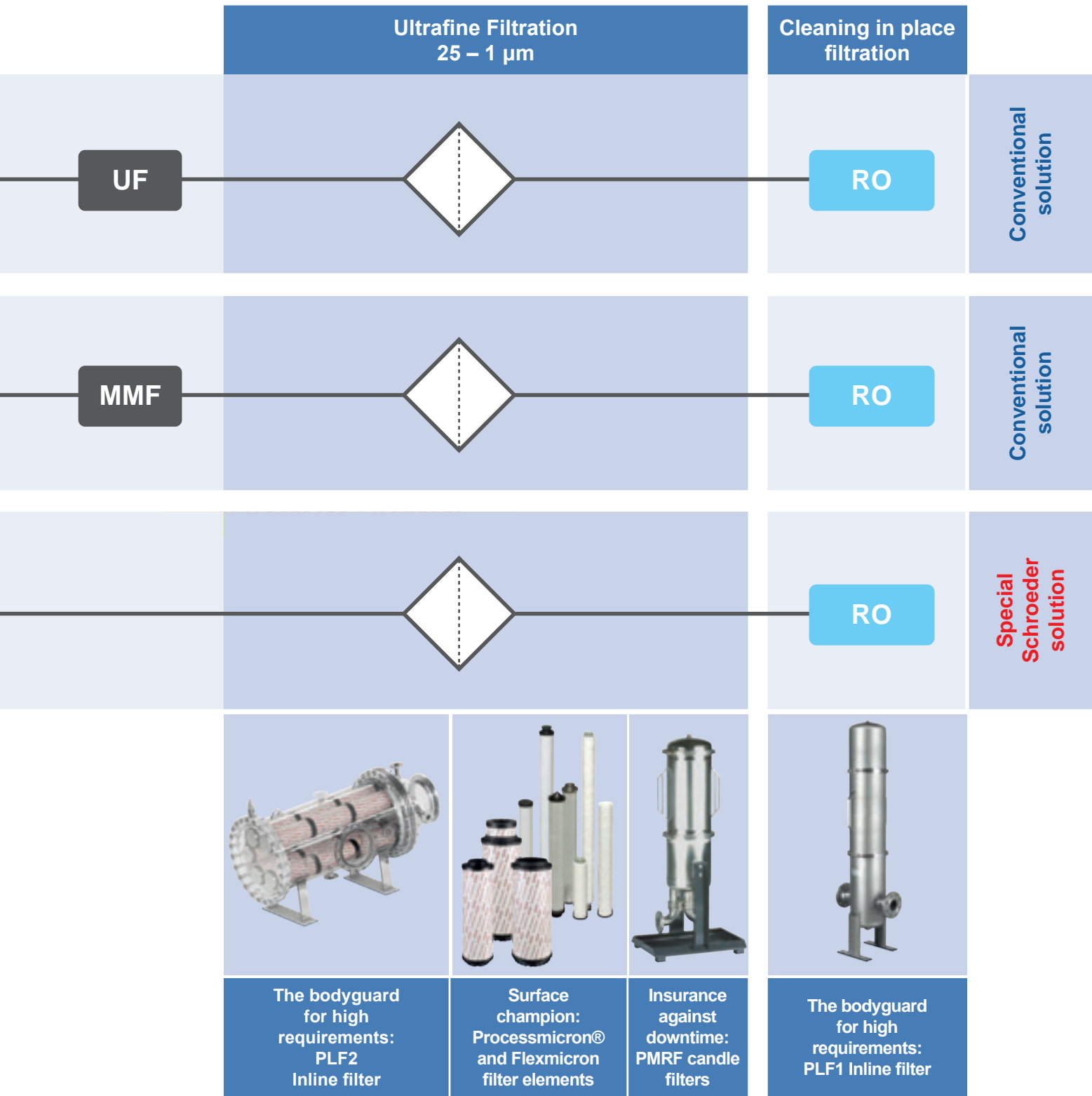
Challenges in water treatment...

A reverse osmosis plant based on semi-permeable membranes is usually at the end of the water processing chain. The pre-filtered untreated water is pumped back through the membrane with a high pressure pump in order to separate it into pure water and waste water. It becomes clear why the condition of the untreated water is of particular importance for the reverse osmosis (RO): contaminated or damaged membranes result in pressure losses and eventually in downtimes or damages to the entire system.



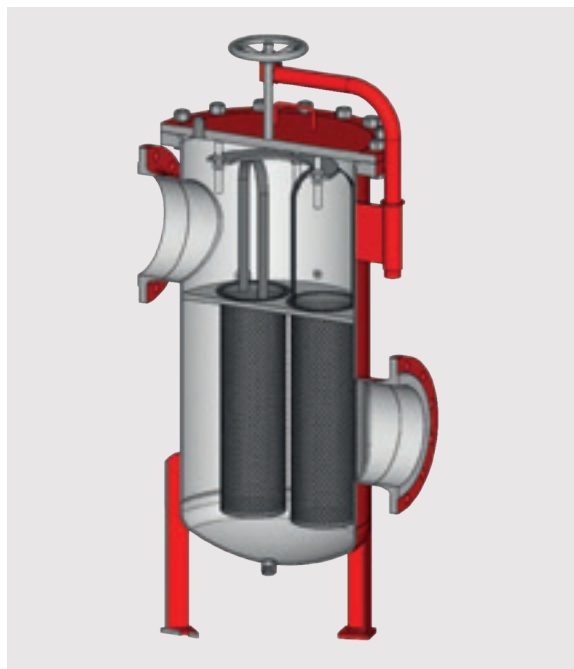
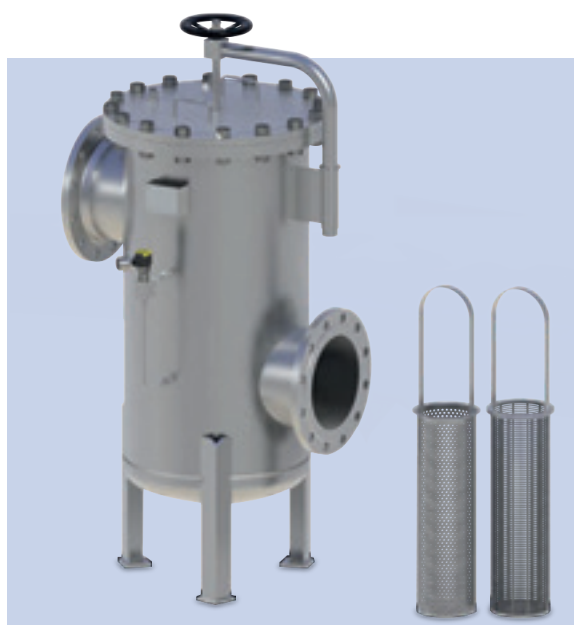
...and the solution from Schroeder Industries

Filter solutions from Schroeder Industries can be used both as protective filters and work filters. As protective filters they would be used for the pre-treatment of the media for the protection of ultra filtration systems (UF) or multi-media filters (MMF), and as work filters they can even take over the functions of ultra-filtration systems (UF) or multi-media filters (MMF) and perform the entire pre-treatment of the water prior to the reverse osmosis.



Coarse Filtration ($\geq 200 \mu\text{m}$)

PRFS/PRFSD Screen Basket Filter



Sectional view PRFS

Product Description

- Screen basket filter – also available as double filter
- Used as coarse filter, bypass filter or pre-separator

Screen Basket Technology

- Screen basket insert with bracket
- Wire mesh 25 to 1000 μm
- Wedge wire: 50 to 3000 μm
- Perforated plate 3000 to 10000 μm

Product Advantages

- High filtration efficiency
- Simple handling
- Robust filter materials – ideal for long-term operation
- Cleanable filter materials
- Low operating costs
- Particles cannot enter the clean side when changing the basket
- Also available as a switchable double filter

Specifications: PRFS / PRFSD Screen Basket Filter

Nominal Size	DN 50 – DN 700
Volume Flow Q_{max}	3600 m ³ /h
Operating Pressure p_{max}	16 bar
Filtration Ratings	25 μm to 10000 μm

Product Description

- Coarse separation by centrifugal force with guaranteed filtration ratings
- 2-stage operating principle:
 1. Centrifugal separation tackles high contamination load
 2. Conical filter element guarantees the filtration rating

Filter Element Technology

- Depending on the specific weight, even particles $< 100 \mu\text{m}$ are separated effectively
- Wedge wire or SuperMesh wire mesh 200 to 3000 μm
- Optional: SuperFlush non-stick coating

Product Advantages

- No transfer of contamination to the clean side
- Suitable for a wide variability in the quality of untreated water
- Consistent filtrate quality
- Also available as skid



Sectional drawing for AutoFilt® ATF



Skid solution

Specifications: AutoFilt® TwistFlow Strainer ATF

Nominal Size	G 1" – DN 200
Volume Flow Q_{max}	400 m ³ /h, higher volume flows with skid solution possible
Operating Pressure p_{max}	16 bar
Filtration Ratings	Dependent on particle nature and operating conditions

Coarse Filtration ($\geq 200 \mu\text{m}$)

AutoFilt® ATF TwistFlow Strainer

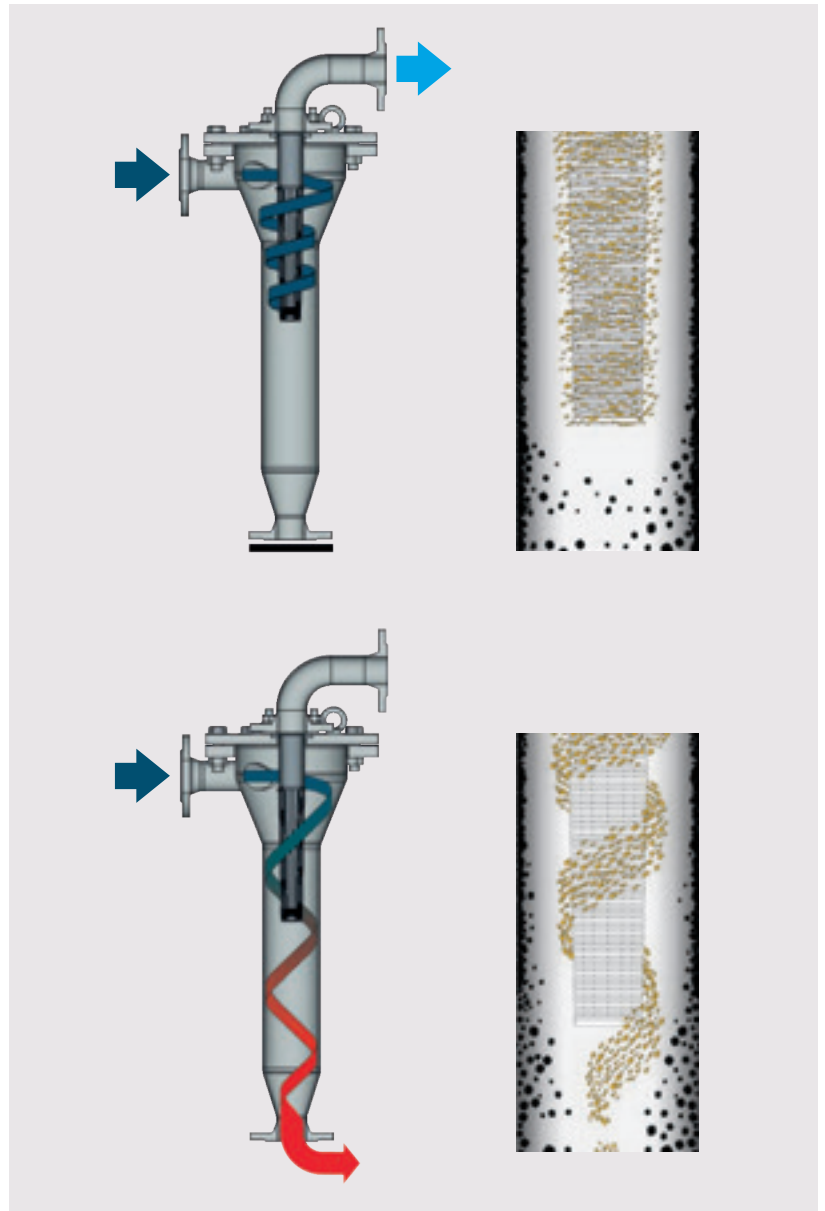
Mode of Operation

Filtration

- Fluid enters the housing tangentially
- As a result of the tangential inflow and the conical housing cross-section, the fluid flows down in a spiral shape
- Particles with a high density are pressed against the housing wall by the centrifugal forces, and are deposited in the lower section of the housing
- Particles with a low density, which are not deposited below, are separated out by the conical slotted tube filter element with a defined filtration rating

Cleaning

- Deposited particles and those separated by the conical slotted tube filter element collect in the lower section and are removed periodically
- Cleaning is performed by flushing with unfiltered fluid
- Filtration is continuous as only partial flow is used for flushing



The AutoFilt® TwistFlow Strainer ATF can achieve ratings finer than $200 \mu\text{m}$

Depending on the specific weight, even particles $< 100 \mu\text{m}$ are separated effectively. While conventional hydrocyclones under changed operating conditions risk contamination reaching the clean side, the conical wedge wire in the AutoFilt® ATF performs a protective function (safety filter) with defined filtration ratings, preventing contamination from reaching the clean side.

Efficiency / Particle Size	Specific Weight 7.5 g/cm^3	Specific Weight 2.6 g/cm^3	Specific Weight 1.7 g/cm^3
$> 100 \mu\text{m}$	99 %	98 %	77 %
$100 - 75 \mu\text{m}$	92 %	84 %	35 %
$75 - 50 \mu\text{m}$	87 %	78 %	21 %



Product Description

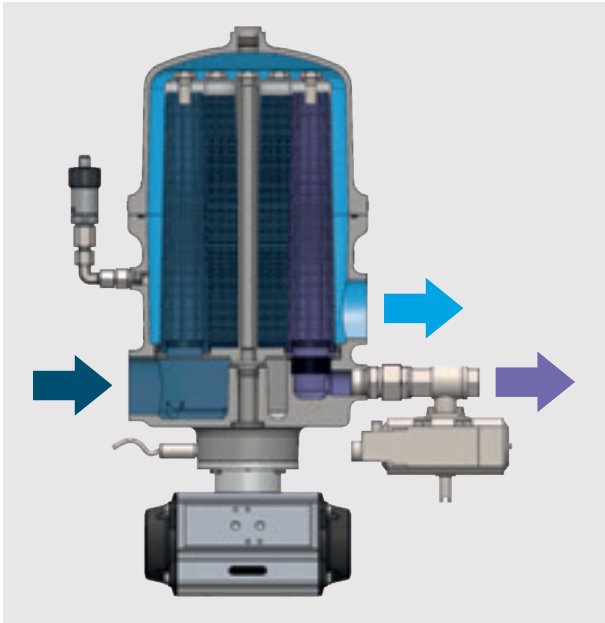
- Self-cleaning automatic stainless steel back-flushing filter for water applications
- Separation of solid particles

Filter Element Technology

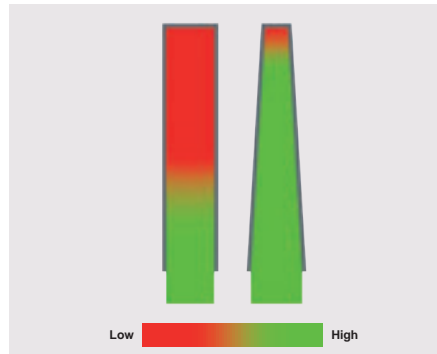
- Conical filter elements
 - Wedge wire (50 µm – 1000 µm)
 - SuperMesh wire mesh, 3-layer, sintered (25 µm, 40 µm, 60 µm)
 - Optional SuperFlush non-stick technology

Product Advantages

- Conical filter elements
- Ready-to-operate unit
- Compact design with innovative sealing concept and quick-opening
- Fully automatic operation
- No interruption of filtration during back-flushing
- Full filtration performance following back-flushing
- Maximum utilization of the filter area
- Low operating costs
- Low maintenance costs



Sectional drawing for AutoFilt® RF4W



Back-flushing efficiency in conical filter elements compared to conventional cylinder filter elements

Specifications: AutoFilt® RF4W

Nominal Size	G 2"
Volume Flow Q_{\max}	27 m³/h
Operating Pressure p_{\max}	16 bar
Filtration Ratings	25 µm to 1000 µm

Fine Filtration (200–25µm)

AutoFilt® RF3/RF5/RF7



Product Description

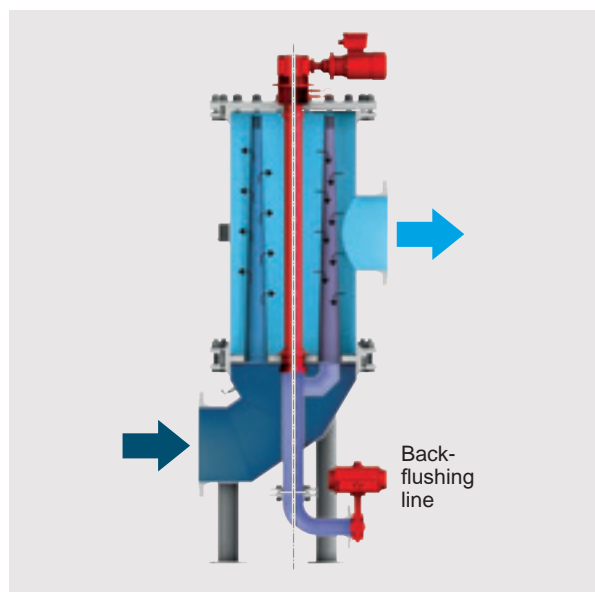
- Self-cleaning automatic filter in:
 - vertical design: AutoFilt® RF3 / RF5
 - horizontal design, space-saving: AutoFilt® RF7
 - economy design with vertical inlet, up to 200 µm: AutoFilt® RF5

Filter Element Technology

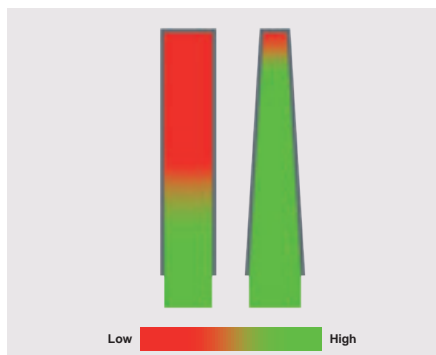
- Conical filter elements
- Wedge wire: 50 to 3000 µm
- SuperMesh wire mesh: 25 to 60 µm

Product Advantages

- Product advantages
- Automatic back-flushing reduces operating costs
- Isokinetic filtration and back-flushing provides greater efficiency
- Variable flange positions
- Numerous material and control variants
- No interruption of the filtrate flow during back-flushing
- Proved its worth over a thousand times



Sectional drawing for AutoFilt® RF3



Back-flushing efficiency in conical filter elements compared to conventional cylinder filter elements

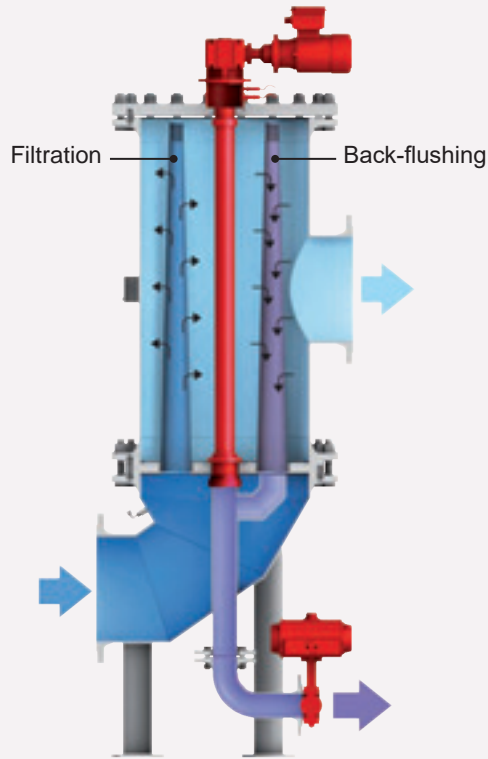
Specifications: AutoFilt® RF3/RF5/RF7

Nominal Size	G 1" – DN 900
Volume Flow Q_{\max}	7500 m³/h
Operating Pressure p_{\max}	100 bar
Filtration Ratings	25 µm to 3000 µm

Versions

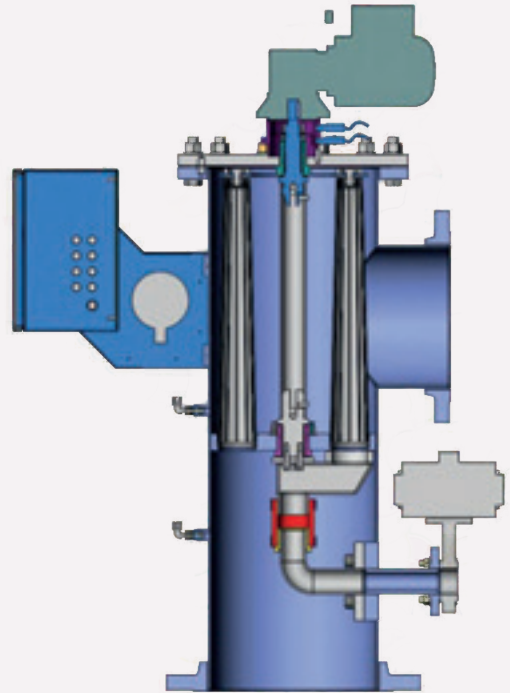
AutoFilt® RF3

The allrounder –
proved its worth over a thousand times



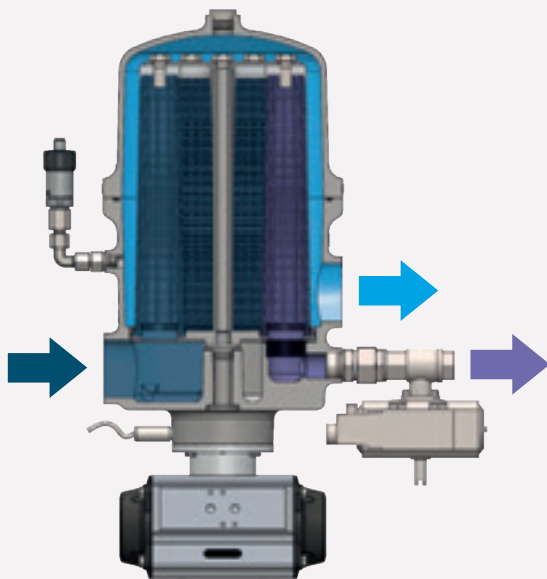
AutoFilt® RF5

Economy with vertical inlet up to 200 µm



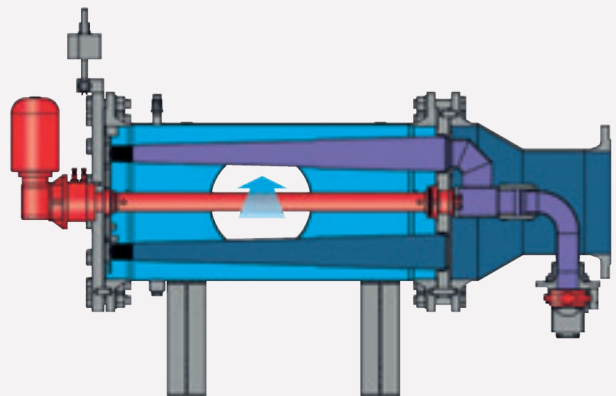
AutoFilt® RF4

Compact for low flow rates



AutoFilt® RF7

Horizontal design saves space

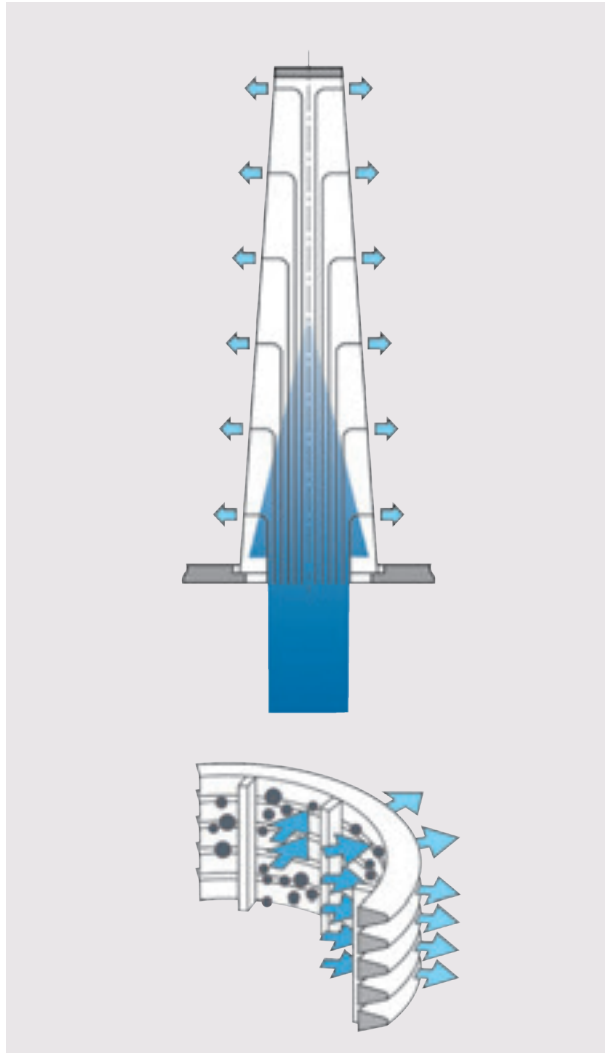


Fine Filtration (200–25µm)

AutoFilt® RF3/RF5/RF7

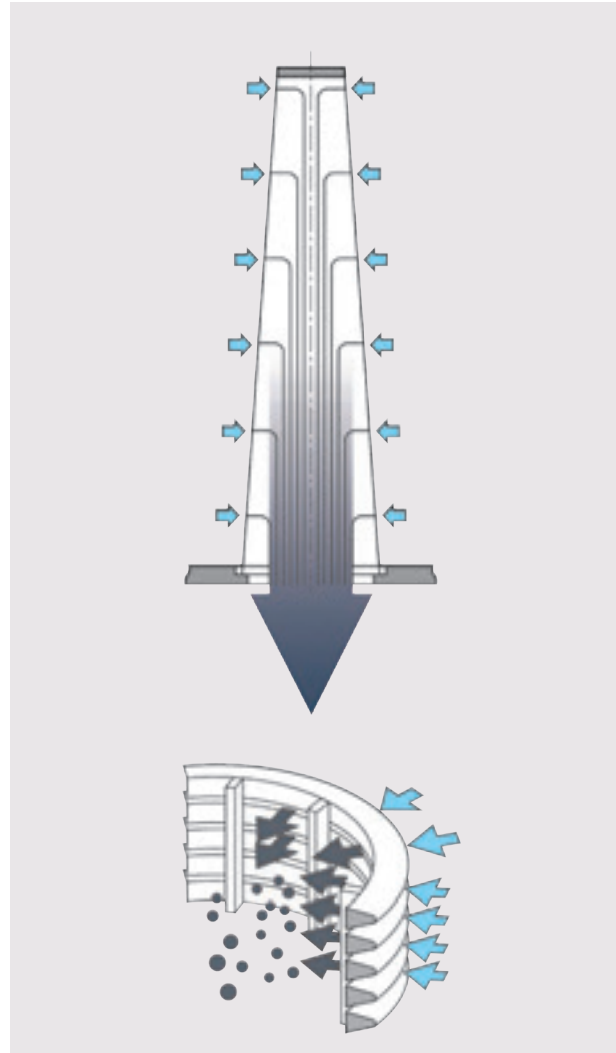
Mode of Operation

Filtration



- The medium being filtered flows through the filter elements from the inside to the outside
- Contamination particles then collect on the smooth inside of the filter elements
- As the level of contamination increases, the differential pressure between the contaminated and clean sides of the filter increases.
- If the pressure loss reaches the differential pressure trigger point, back-flushing starts automatically.

Back-flushing



- AutoFilt® RF3 / RF5 / RF7:
The gear motor rotates the flushing arm under the filter elements that need cleaning
- AutoFilt® RF4W:
During automatic back-flushing, the pneumatic drive rotates the filter element plate, including the filter elements, into the correct position, so that a contaminated filter element sits over the flushing opening
- The back-flush valve is opened
- The pressure drop between filtrate side and back-flush line flushes a small amount of the filtrate back through the contaminated filter elements
- The contaminant particles deposited on the inside of the filter elements are loosened and flushed into the back-flush line via the flushing arm



Product Description

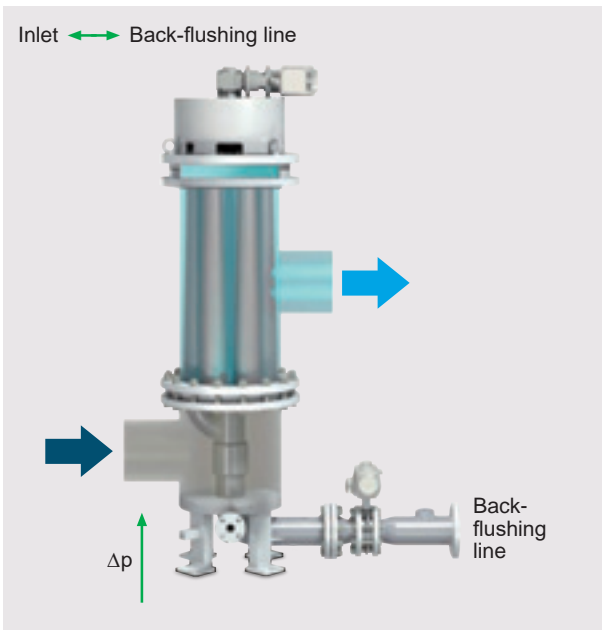
- Self-cleaning automatic filter
- Hydrodynamic suction effect
- Conical JetFlush technology

Filter Element Technology

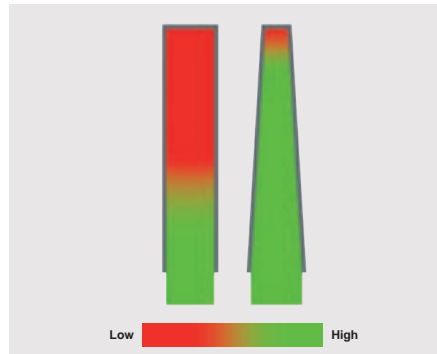
- Conical filter elements
- Wedge wire: 50 to 3000 µm
- SuperMesh wire mesh: 25 to 60 µm

Product Advantages

- Back-flushing independent of pressure on clean side of filter
- Dependent only on the inlet pressure
- Highly efficient back-flushing with low pressure conditions and long back-flush lines
- Suitable for high contamination



Back-flushing independent of pressure on clean side of filter



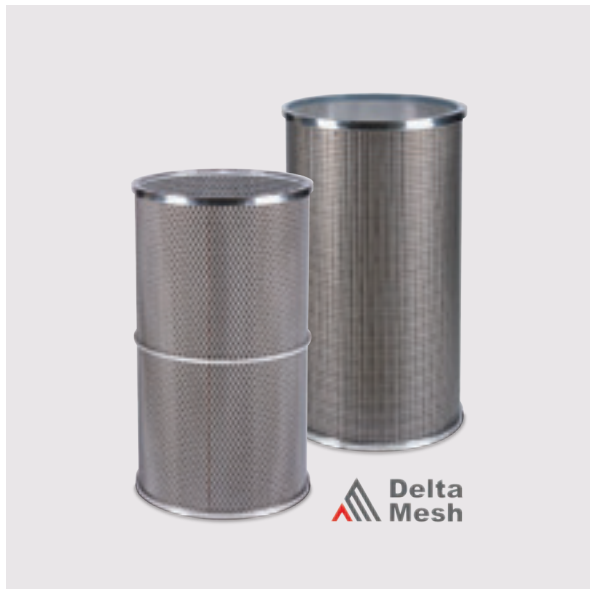
Back-flushing efficiency in conical filter elements compared to conventional cylinder filter elements

Specifications: AutoFilt® RF10

Nominal Size	DN 100 – DN 600
Volume Flow Q_{\max}	3500 m³/h
Operating Pressure p_{\max}	6 bar
Filtration Ratings	25 µm to 1000 µm

Fine Filtration (200–25µm)

AutoFilt® RF14



Product Description

- Basket-based back-flushing filter system
- Self-cleaning automatic fine filter
- Separation of suspended solid particles from low viscosity fluids
- HySuction – optimized back-flushing technology

Filter Element Technology

- Plain screen baskets for challenging types of dirt and Δ -mesh baskets for maximum power density
- Innovative mesh structures for maximum service life
- Fine stainless steel mesh in standard with filtration ratings of 20 to 80 µm

Product Advantages

- Fully automatic back-flushing reduces the operating costs
- Uninterrupted filtration
- Flow-optimized filter design
- High process reliability thanks to HySuction back-flushing
- Optimum regeneration of the filter baskets for wide range of dirt types and filtration ratings
- Axial gap technology offers maximum process reliability
- Basket technologies can be changed even for existing filters
- Filter design particularly maintenance-friendly
- Davit available as an option

Specifications: AutoFilt® RF14

Nominal Size	DN 50 – DN 700
Volume Flow Q_{\max}	4460 m³/h
Operating Pressure p_{\max}	6 bar*
Filtration Ratings	I 20 µm to 80 µm

* Higher pressure ranges on request

Function

Filtration

- The fluid to be filtered flows through the filter basket of the back-flushing filter, passing from the inside to the outside
- Particles then collect on the inside of the filter basket
- As the level of filter contamination increases, the differential pressure between the contaminated and the clean side increases
- When the differential pressure reaches the pre-set trigger point, back-flushing of the filter basket starts automatically
- The axially arranged cleaning device is rotated by the gear motor
- The cleaning nozzles slide over the entire inside of the filter basket in the radial direction, back-flushing the filter mesh
- No interruption of the filtrate flow during back-flushing

Initiation of Automatic Back-Flushing

You can choose how the back-flushing is initiated:

- When the pre-set triggering differential pressure is exceeded
- By means of set time override
- By pressing the "TEST" button

Procedure for Automatic Back-Flushing – Back-Flush Cycle

- When the back-flushing is initiated, the gear motor starts and rotates the axially arranged cleaning device with individual cleaning nozzles
- The back-flush valve in the back-flush line is opened
- Due to the differential pressure arising between filtrate line and back-flush line, a partial reversal of flow occurs in the area surrounding the cleaning nozzles
- Part of the filtrate flows from outside to inside through the filter basket into the openings of the cleaning nozzles, while the contamination adhering to the inside of the filter basket is carried along by the flow that develops
- While the gear motor continues to rotate, the cleaning nozzles slide along the entire inside of the filter basket radially
- This results in the filter basket being entirely cleaned
- Once the back-flush cycle is complete, the back-flush valve in the back-flush line closes and the rotation of the motor stops

Illustration of filtration

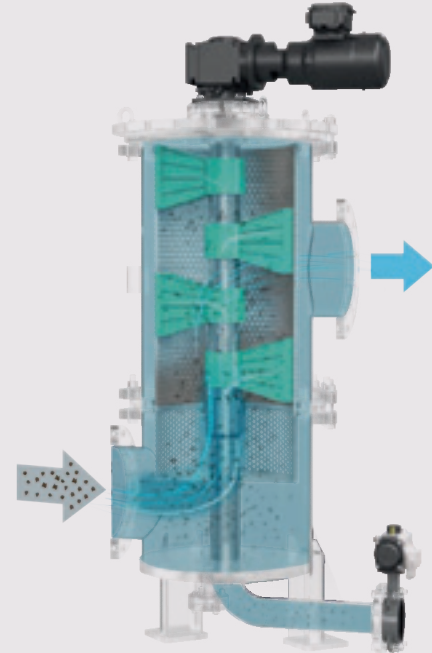
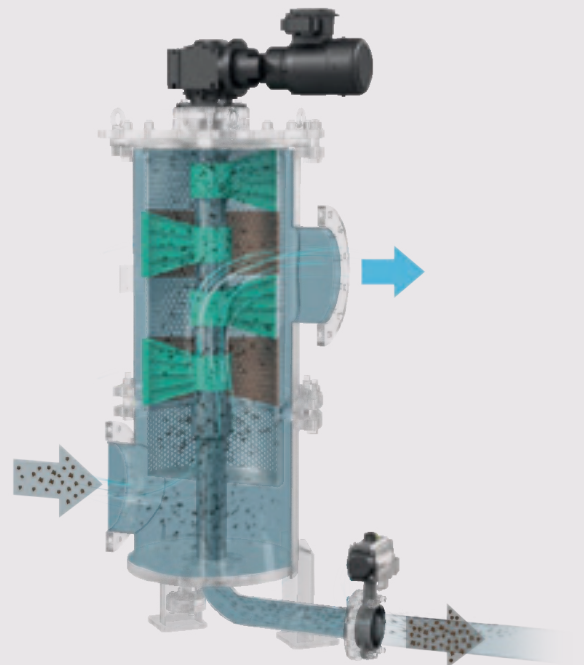
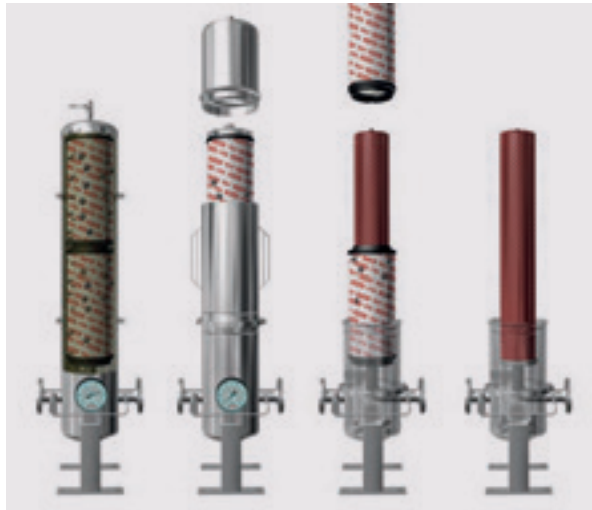


Illustration of back-flushing



Ultrafine Filtration (25–1 µm)

PLF1 Inline Filter



Sectional and functional drawing for PLF1

Product Description

- Continuous separation of solids from low viscosity fluids
- One-step filter housing for up to two filter elements
- Flow rates up to 200 m³/h

Filter Element Technology

- High quality filter elements made from polyester or polypropylene
- Multi-layer filter mat construction
- Staged (graduated) depth filtration
- Protection for the clean side

Processmicron® filter elements in 3 versions:



1) Work Filtration

Larger flow surface for higher contamination loads

- HighFlow 6"



2) Comprehensive Work Filtration

Twice the safety, even for contamination peaks due to cascade effects

- HighLoadCascade 9"



3) Protective Filtration

High volumetric flows

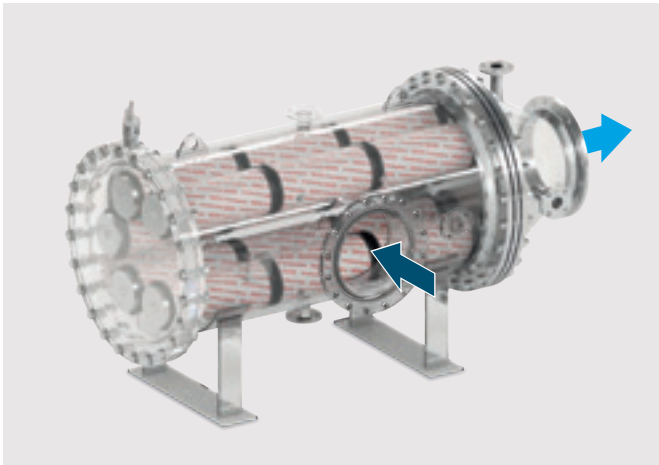
- HighFlow9"

Product Advantages

- Excellent deposition rates
- Low pressure drops due to large cross sections and filter areas
- Very large filter area per filter element
- Compact design with high flow rates
- Flow-optimized design
- Protection of the clean side during element change
- High contamination retention capacity
- Modular design gives optimal flexibility in catering for every application

Specifications: PLF1 Inline Filter

Nominal Size	DN 40 – DN 150
Volume Flow Q_{\max}	200 m ³ /h
Operating Pressure p_{\max}	16 bar
Filtration Ratings	1 µm to 90 µm



Sectional view PLF2

Product Description

- Continuous separation of solids from low viscosity fluids
- One-step filter housing for up to 21 filter elements
- Flow rates up to 3000 m³/h

Filter Element Technology

- High quality filter elements made from polyester or polypropylene
- Multi-layer filter mat construction
- Staged (graduated) depth filtration
- Protection for the clean side

Processmicron® filter elements in 3 versions:



1) Work Filtration

Larger flow surface for higher contamination loads

- HighFlow 6"



2) Comprehensive Work Filtration

Twice the safety, even for contamination peaks due to cascade effects

- HighLoadCascade 9"



3) Protective Filtration

High volumetric flows

- HighFlow9"

Product Advantages

- Excellent deposition rates
- Low pressure drops due to large cross sections and filter areas
- Very large filter area per filter element
- Compact design with high flow rates
- Space-saving horizontal filter design
- Flow-optimized design
- Protection of the clean side during element change
- High contamination retention capacity
- Modular design gives optimal flexibility in catering for every application

Specifications: PLF2 Inline Filter

Nominal Size	DN 200 – DN 600
Volume Flow Q_{\max}	3000 m ³ /h
Operating Pressure p_{\max}	16 bar
Filtration Ratings	1 µm to 90 µm

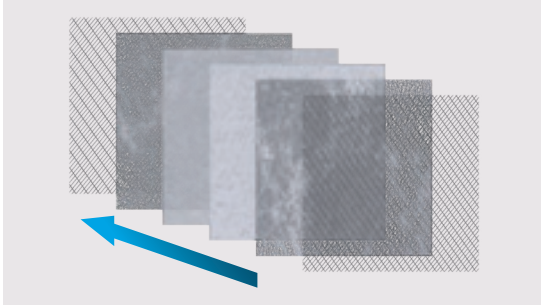
Ultrafine Filtration (25–1 µm)

Processmicron® Filter Elements PLF1/PLF2

Technical Data

Filtration ratings:	Length:	Type of filter element:	Filter material:
1 µm to 90 µm	20", outer diameter 6" or 9"	pleated or Spun Spray	polyester or polypropylene

Design of Processmicron® Filter Elements



Multi-layer filter mat construction

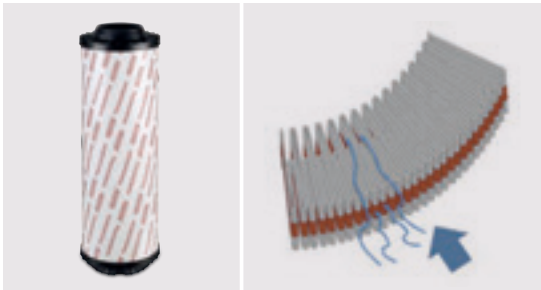
- Robust and high-quality layer structure
→ No skewing of the filter layers
- High contamination retention
- Low pressure loss



Staged (graduated) depth filtration

- High purity in single passage
- High layer thickness of the filter medium
→ High storage volume for contamination

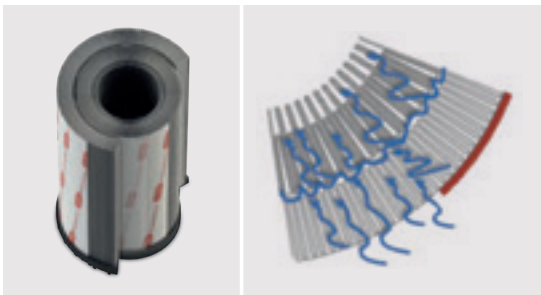
The right filter element for optimal particle filtration



HighFlow 6"

Working filtration:

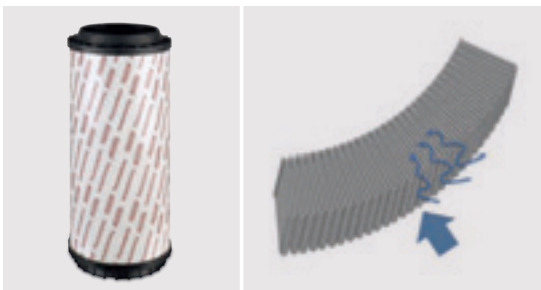
- M-pleat
- Optimized, enlarged upstream area for high polluting loads



HighLoad Cascade 9"

Comprehensive working filtration:

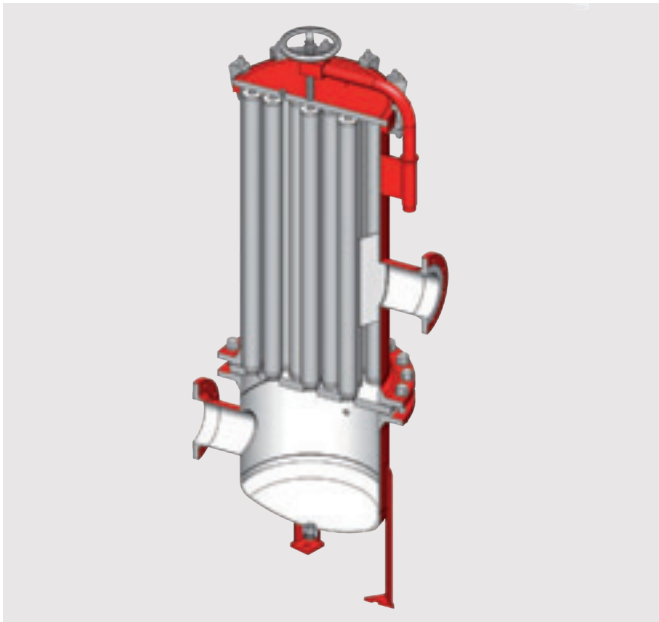
- Combination of parallel folds (outside) and M-folds (inside)
- Double security, even with contamination surges, thanks to cascading effect
- Selection of filter layers precisely tailored to the filtration task at hand (outer and inner layers)



HighFlow 9"

Protective filtration:

- Pleated filter element construction (parallel folding)
- High flow rates
- Extreme fold stability through parallel folding at large filter element circumference



Sectional view PMRF

Product Description

- Separation of solid particles from low viscosity fluids
- Suitable for applications with the highest cleanliness requirements
- Tried-and-tested candle filter technology for finest filtration
- Also available as a switchable double filter

Filter Element Technology

- Filtration ratings: 1 µm to 90 µm
- **Flexmicron Premium:** durable, pleated filter elements (pleat technology) with low layer thickness made from melt-blown or high-quality glass fibers for graduated depth filtration
→ Long service life even in fluids difficult to filter
- **Flexmicron Standard:** Spun Spray depth filter elements (melt-blown) for graduated depth filtration: high cleanliness in a single pass, high filter thickness of filter medium
→ High storage volume for contamination
- **Flexmicron Economy:** Spun Spray depth filter elements (melt-blown) suitable for applications with medium requirements for fluid and type purity
→ Inexpensive solution

Product Advantages

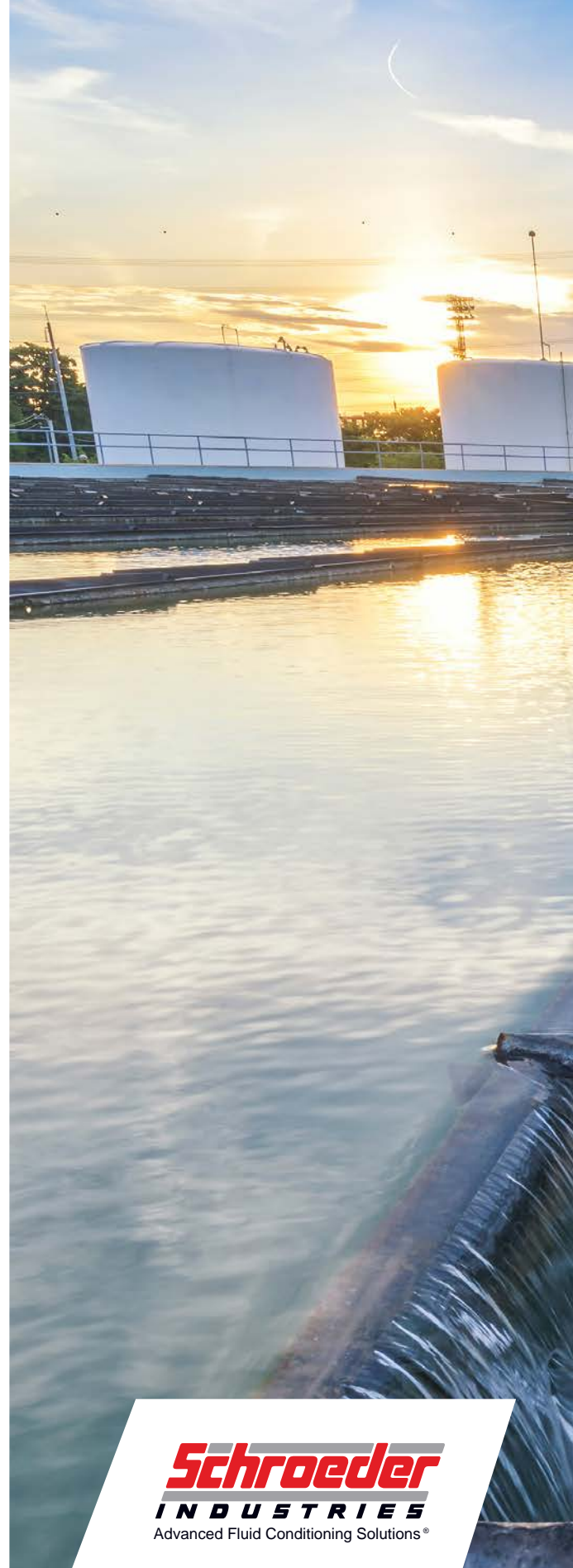
- Economic operation through high quality standards, defined filtration rates and high separation values
- Compact housing with high flow rates
- Service-friendly for filter element change
- Efficient system and component protection
- Environmentally safe disposal, as incinerable

Specifications: PRMF Candle Filters

Nominal Size	G 1" – DN 250
Volume Flow Q_{\max}	1200 m³/h
Operating Pressure p_{\max}	40 bar
Filtration Ratings	1 µm to 90 µm

[illegible]

Working with over 100 partners worldwide, Schroeder Industries remains at the forefront in the fields of fluid conditioning, diagnostics, and specialized energy products. Our process filtration division provides exceptional products and services benefiting a broad range of industrial applications, including:

**Agriculture****Automotive Manufacturing****Chemical Processing****Industrial****Machine Tool****Marine****Mining Technology****Offshore****Paper Industry****Power Generation****Sewage Water and Waste Water Treatment****Steel Making****Thermal Transfer**

Schroeder
INDUSTRIES
Advanced Fluid Conditioning Solutions®



*To access more information about Schroeder, scan the code with your app-enabled smartphone.

© Copyright 2022 Schroeder Industries. All rights reserved

www.schroederindustries.com | 580 West Park Road | Leetsdale, PA 15056-1025 | 724.318.1100 p | sisales@schroederindustries.com