Filter Cartridges for Reverse Osmosis Plants

Patented media string-wound filter cartridges for effective and efficient removal of impurities such as silt, sand, rust and other suspended particles from RO feed water.

Minimizes fouling and membrane degradation.

Results in improved process economics, reduced operation and maintenance issues.
Fouling can seriously reduce performance by lowering productivity and salt rejection, and increasing pressure differential across the system.

In the reverse osmosis (RO) process, water passes through a semi-permeable membrane, separating dissolved contaminants and giving pure water. This membrane is highly sensitive to fouling or damage from incorrectly treated feed water. To increase the efficiency and life of RO systems, effective pretreatment of the feed water is required.

**Pretreatment**
Dependent on the characteristics of the raw water, a myriad of pretreatment steps are required to prepare the feed water for the RO process. These include straining, chlorination, coagulation/flocculation, clarifiers, acid addition, pH adjustment, softening, ion exchange, scale inhibitors, multi-media filtration, oxidation, dechlorination, biocidal treatment, activated carbon filtration, UV sterilization, and cartridge filtration.

Proper pretreatment will maximize efficiency and membrane life by minimizing fouling, scaling and membrane degradation. Pretreatment optimizes product flow, product quality (salt rejection) and product recovery. This results in improved process economics, and reduced operation and maintenance issues.

**Fouling**
Fouling is the most significant factor affecting the performance of RO systems. Fouling results from the accumulation of foreign materials from feed water on the membrane surface. Fouling can be from (1) scaling by precipitation and deposition of salts, (2) colloidal or silt fouling from entrapment of particulate or colloidal matter such as bacteria, clay, colloidal silica and iron corrosion products (iron flocs), (3) biofouling from the growth of a biofilm from microorganisms such as bacteria, algae, fungi, viruses, and higher organisms, and (4) organic fouling from the adsorption of organic compounds such as humic substance and oil on the membrane surface.

**Guidelines for feed water quality**
The common indicators of suspended particles used in the RO industry are silt density index and turbidity.

<table>
<thead>
<tr>
<th>Component</th>
<th>Max. level</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDI</td>
<td>4</td>
<td>Indicates the quantity of particulate matter in water and correlates with the fouling tendency of RO systems.</td>
</tr>
<tr>
<td>Silt Density Index</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NTU</td>
<td>1</td>
<td>Turbidity is an expression of the optical property of water that causes light to be scattered and absorbed rather than transmitted in straight lines through the sample. Turbidity is caused by suspended and colloidal particulate matter.</td>
</tr>
<tr>
<td>Turbidity</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Filter Cartridges for Reverse Osmosis Plants

Cartridge filtration is the final safety step to protect the membranes and high pressure pump from any suspended particles.

RO system manufacturers recommend final pre-filtration before the pressure pump and membrane with filter cartridges of ≤ 5 micron. Properly selected cartridge filtration as the final safety step has a number of benefits:

- Protects membranes and high pressure pump
- Removes any remaining suspended particles
- Reduces membrane cleaning requirements
- Reduces risk of fouling
- Removes residual flocks and particles after multimedia
- Provides useful information regarding fouling risks and cleaning requirements (by regular inspections of used cartridges)
- Indicates extent of fouling with increase in pressure drop. For example, if the differential pressure across the filter increases rapidly, it is an indication of possible problems in the raw water supply or in the pretreatment process
- Provides short-term protection for the membranes while corrective action is taking place

Filter Cartridge Test Results

Dirt holding capacity

Pressure drop vs. flow rate

Ratings are based on laboratory tests for 10 inch cartridges as per ASTM F795 standard at ambient temperature and 3 gpm (US) water flow rate. Flow rate vs. pressure drop data is based on clean water at an ambient temperature of 25 °C. Results in actual use will be influenced by the type of fluid and contaminant as well as flow rate and temperature.
Superior Filtration Technology

Sedifilt Filters for Reverse Osmosis plants have proven exceptional performance. A wide chemical compatibility and customization possibilities result in improved economics tailored to the individual application. Sedifilt Filters improve water quality, process efficiency and also provide process protection by removing suspended solids such as dirt, iron particulates and deformable gel type contaminants.

True graded density structure of Sedifilt cartridges ensure higher dirt holding capacity, longer service life, and fewer change outs.

Features
- 100% polypropylene – inert material, excellent micro-organism resistance.
- No chemicals to leach-out with new melt spinning and yarn forming process.
- No media migration because the yarn consists of continuous filaments.
- True graded density – new winding technology gives denser winding in inner layers and coarser winding in outer layers.
- High dirt holding capacity and longer life as particles are trapped throughout the entire cross section of the filter.
- Better performance - multi-lobal cross section filaments with random 3-dimensional media structure captures more particles compared to conventional filters.
- High bulk media having improved void to solid ratio gives higher flow rates with low pressure drop.
- High structural stability, i.e., no shifting of media, excellent knife-edge sealing.
- Structural firmness results in greater resistance to particle unloading and hence more consistent performance.
- Incinerates to trace ash with no hazardous volatiles for environmentally friendly disposal.

Sedifilt Media
Sedifilt media has high bulk, stable, three-dimensional random structure comprising continuous filaments.
Filter cartridges

Pure polypropylene Sedifilt filter cartridges are free from any extractables and contain no lubricants, wetting agents, emulsifiers, ant-oxidants or anti-static agents, etc. The standard pure polypropylene cartridge is engineered for superior filtration performance. Available in up to 72 inch (1829 mm) length and up to 6 inch (152 mm) diameter.

Sedifilt filter cartridges offer lower pressure drop, higher dirt holding capacity and true depth filtration.

End Adapters
Polypropylene end adapters are thermally-welded to the pure polypropylene Sedifilt filter. The positive weld assures bypass-proof performance and structural integrity without adhesives or additives, maintaining cartridge purity. All adapters are molded of the same polypropylene as the cartridge for chemical compatibility and ease of disposal.

Filter Cores
Filter cores are available in polypropylene, stainless steel (304/316L) and galvanized carbon steel, in regular, extended and tapered configurations.

Clean manufacturing and environmentally safe product lifecycle

Sedifilt filter cartridges are made using a clean and energy efficient manufacturing process, with no byproducts or waste. Sedifilt filter cartridges can be recycled into other products, or incinerate to trace ash, with no harmful residues to the environment.
Sedifilt Filter Cartridges are used in industrial RO systems and large-scale municipal supply plants.

Customers can count on our continued commitment to research and development.

We provide active support to customers towards the development and improvement of filter cartridges to meet process requirements. Our research and development efforts are to continuously improve our products.

We conduct testing at our own state-of-the-art in-house testing laboratory. This is equipped with a filter cartridge test rig, laser particle counter, digital microscope, turbidity measuring instrument, SDI measurement instruments, and microbiology and chemistry equipment, etc.

Our test laboratory enables us to provide customers with tailor made cartridges.
Ordering information

Sedifilt filter cartridges can be made to order in custom sizes (custom lengths, inner diameter and outer diameter) in various filter media and core material, and tailored density gradings.

<table>
<thead>
<tr>
<th>Length</th>
<th>Outer diameter</th>
<th>Number per box (standard packing)</th>
<th>Gross weight per box (kg)</th>
<th>Quantity in 20 ft. container load (without pallets)</th>
<th>Quantity in 20 ft. container load (on pallets)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10&quot;</td>
<td>2 1/2&quot;</td>
<td>30</td>
<td>6</td>
<td>25,200</td>
<td>19,500</td>
</tr>
<tr>
<td>20&quot;</td>
<td>2 1/2&quot;</td>
<td>30</td>
<td>1</td>
<td>12,600</td>
<td>9,750</td>
</tr>
<tr>
<td>30&quot;</td>
<td>2 1/2&quot;</td>
<td>30</td>
<td>16</td>
<td>8,400</td>
<td>6,480</td>
</tr>
<tr>
<td>40&quot;</td>
<td>2 1/2&quot;</td>
<td>20</td>
<td>14.5</td>
<td>6,300</td>
<td>4,880</td>
</tr>
<tr>
<td>50&quot;</td>
<td>2 1/2&quot;</td>
<td>20</td>
<td>18</td>
<td>5,040</td>
<td>3,900</td>
</tr>
</tbody>
</table>

When ordering for the first time, please specify all details in writing. Media, actual length, micron rating, outer and inner diameters, and core material are required. End adapters are optional. Contact us for further information.

Backup stocks are maintained in our warehouse for prompt deliveries. Packaging is in good quality top loading box-board cartons. Both palletized and non-palletized deliveries are made.

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**SRO 40A5A E222/C**

**Length**

<table>
<thead>
<tr>
<th>Nominal (inch)</th>
<th>Actual (inch)</th>
<th>Actual (mm)</th>
<th>Variation in Length</th>
<th>Outer Diameter (mm)</th>
<th>End Adapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>9 7/8</td>
<td>250.8</td>
<td>A = Specified length</td>
<td>A = 63.5</td>
<td>E222/C = Two end caps, one with double 222 O-rings (E222), other end flat closed (EO)</td>
</tr>
<tr>
<td>20</td>
<td>19 1/4</td>
<td>501.7</td>
<td>None = Nominal length</td>
<td>E = 60</td>
<td>E22 = Double 222 O-rings end cap</td>
</tr>
<tr>
<td>30</td>
<td>29 5/8</td>
<td>752.5</td>
<td>D = 100</td>
<td>D = 100</td>
<td>EC = Closed end cap</td>
</tr>
<tr>
<td>40</td>
<td>39 1/2</td>
<td>1003.3</td>
<td>J = 114.5</td>
<td>J = 114.5</td>
<td>ES = Stepped end</td>
</tr>
<tr>
<td>50</td>
<td>49 1/4</td>
<td>1251.0</td>
<td>Actual length of standard nominal lengths is specified on the left. For custom length in inches followed by an A for variation in length from standard.</td>
<td></td>
<td>ER = Reusable stainless steel spring</td>
</tr>
<tr>
<td>72</td>
<td>72</td>
<td>1828.9</td>
<td>Customized outer diameters are available up to 152 mm.</td>
<td></td>
<td>EA = Polypropylene molded spring</td>
</tr>
<tr>
<td></td>
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<td>BF = Polypropylene molded fin end cap</td>
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<td>EM = Metal end cap with gasket</td>
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<td>X = Extended core</td>
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<td></td>
<td></td>
<td></td>
<td>XT = Tapered extended core (all core media)</td>
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<td></td>
<td></td>
<td></td>
<td>None = No end adapters (double open end - D0E)</td>
</tr>
</tbody>
</table>

Custom lengths are available up to full 72 inches.
Length does not include end adapter length, in any.

For a standard Sedifilt RO 5 micron 40 inch long (nominal) filter cartridge, the product code will be SRO40-5A. An example of a RO cartridge with all options specified is SRO40A-5AE222/C.
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Superior filtration technology

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