

# Candle Filter

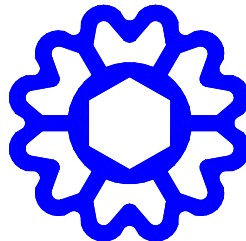
For years, the filtration industry has tried to make a filter that has pores over a high percentage of its surface area. This goal has now been achieved with the Candle Filter System (CFS™), a long-lived filter that has the ability to self-clean in seconds.

## Applications

Like the DTS Tubular UltraFiltration (TUF™) System, the CFS™ protects downstream demineralizers and reverse osmosis membranes from fouling. The smaller footprint and lower cost of the CFS™, along with the fact that it can be run at much lower flow rates than the TUF™, make it an excellent alternative in many applications.

## Filter Elements

CFS™ elements are thermo-plastic wafers with micro-grooves etched on their arc surfaces to allow maximum use of this surface area. A 5-micron rated element has over 2,000 micro-grooves.



## The Candles

CFS™ elements are arranged in columns called “candles.” Candle assemblies consist of stacked wafers, support core, upper support plate, lower compression plate, seal plate, and compression spring. This spring compresses the wafers to allow full surface contact.

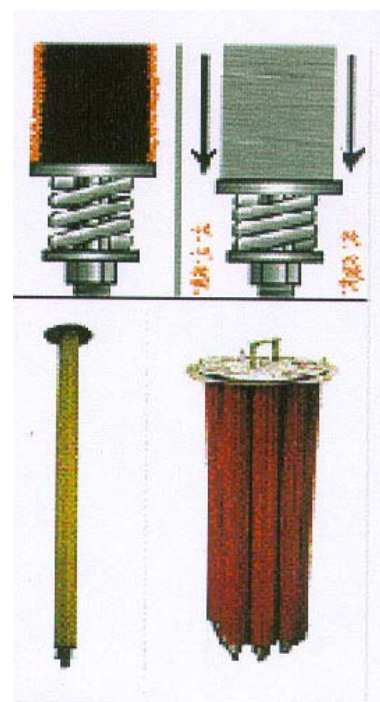
## The System

Candles are grouped into vessels that usually consist of an upper and lower chamber. Each vessel contains from one to several hundred candles, depending on the application.

The candles are suspended from a support plate. The candle assemblies are lowered and secured into the filter vessels.



**CFS™ (with shielding removed)**



**Candle and Candle Assembly**

## Filtration

Dirty fluid enters the filter vessel from the lower chamber, flowing across the filter elements. Clean filtrate is then transported through the elements' conduits to the upper chamber.

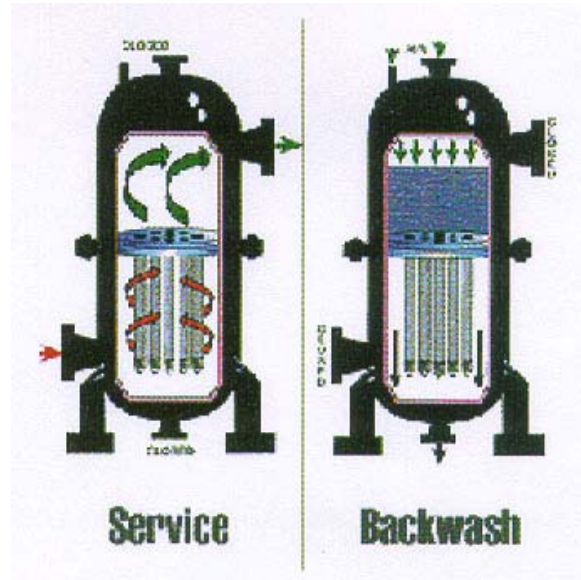
The filtration cycle continues until the pressure drop restricts flow excessively or the potential of driving particulate into the pores is too high. This loading depends upon the types of solids in the feed stream.

## Cleaning

The upper chamber of the vessel acts as a self-contained reservoir where a residual volume of clean fluid is pressurized with air, then used to backwash and clean the filter.

As the fluid flow reverses direction during cleaning, the hydraulic force of the liquid hits the compression plate, causing increased spring compression. This momentarily releases the force on the wafer stacks and allows them to separate.

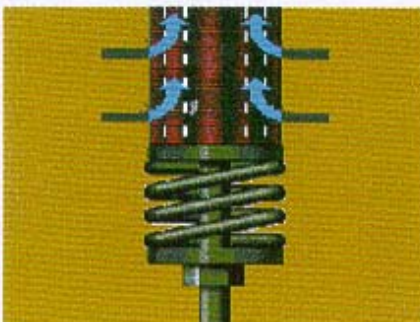
Within seconds, this separating action breaks up the filter cake and dislodges any particulate between the wafers.



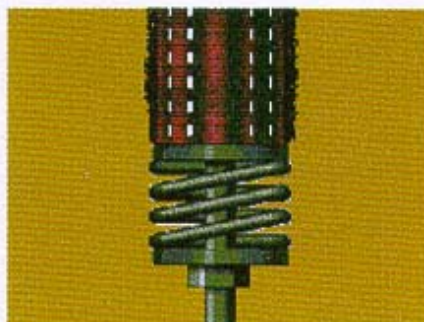
## CFS™ Advantages

The backwash feature of the CFS™ allows this filter to concentrate solids to a small volume for transfer to a disposal container.

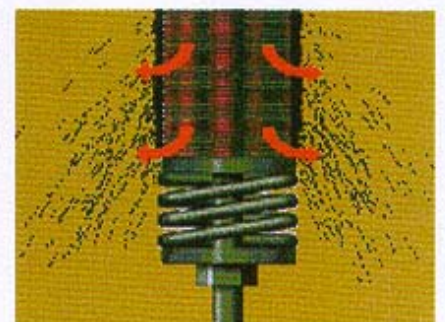
Unlike other backwashable filters, the CFS™ can withstand the high-pressure pulse that restores the filter surface to its original flux rates. The air clears the sludge with minimal backwash volume, and permits the filter to be put back into service quickly.



**Compression End of Candle During Filter Cycle**



**Solids Accumulate on Candle**



**Solids are Discharged from Candle**