

## Show Notes Episode Ultra Filtration

In this episode Michael Urbans and Justin Mest discuss ultrafiltration - what it is, how and where to apply it.

The Master Water UltraPro is specifically designed to look just like a typical backwash filter. The ultrafilter membrane is encased in the filter tank.



Ultrafiltration removes contaminants in the size range of 0.05 – 0.01 microns. A human red blood cell is 7 microns and human hair is 40 microns.

- Ultrafiltration does not remove dissolved substances such as sodium chloride, calcium chloride, etc. Cations and anions are removed or exchanged by reverse osmosis or ion exchange resins.
- Even though we can't see them bacteria, viruses and cysts are suspended solids. UF can remove legionella and cysts which can be chlorine and UV resistant.
- Ultrafiltration can protect municipal water consumers if there is a boil water order.
- Unlike UV, Ultrafiltration units don't require electricity to operate.

Many of the UltraPro's are commonly used to **remove colloidal contaminants such as clay, silt and some organics**. Water which has colloidal contaminants won't be clear- they don't settle out to the bottom. A less convenient solution for these contaminants is chemical precipitation. A chemical is injected into the water to bind up the colloid, it settles out and then it can be filtered. This can be replaced by an ultrafilter – a backwashing filter and a clean water tank to store the treated water.

Ultrafiltration for lake water. Redundancy and or multiple technologies recommended:

- Additional Technology - Blue-green algae - under extreme pressure these cells burst and releases dissolved contaminants which can't be removed.
- Twin UF – Bacteria, viruses, cysts; should not regenerate (backwash) ultrafilter system with untreated water.
- All systems should be followed by UV.

In extreme water or high flow situations multiple Ultrapro tanks can be operated in parallel.

The Ultrapro is unique. It uses Clack valve wetted end with customer circuitry. This can drive 4 drive motors with a single circuit board. As a result, every UltraPro has an automatic flushing mechanism to prevent the bottom of the membrane from fouling.

How to prevent the membrane from failing.

- Lack of proper backwashing will cause the membrane to fail prematurely.
- Fats – greases and oils will destroy the membranes. Pre-treat to remove prior to UF.
  - 10-micron pre-filter
- Overuse of disinfectant/oxidizer such as chlorine. Continuous chlorine feed level of chlorine should be less than 1mg/l. Use the same rules for hydrogen peroxide.

Placement of the ultrafilter

- Place the ultrafilter as far down the line as possible, right in front of the UV.
- An Ultrafilter will remove Ferric Hydroxide but using it for this purpose isn't recommended. Pretreatment using a Turbidex or Filterag Plus filter would be more cost effective.
- Tannin removal – depending on the size of the tannin multiple systems may be required. For example:
  - Carbon – Ultrafilter – Organic Scavenger – UV
  - Carbon – Ultrafilter - UV

Prior to installing test with a pilot stick.

- Tricky to use on a bacterial application.
- Works well with colloidal clay or tannin applications.

- After using the pilot stick it can be backwashed simply by flipping it around and having the water flow backwards. This can usually be done with clean tap water. If you can't clean it after testing the water, then you may need to rethink the treatment method as the same problem will occur on the larger unit.
- Don't refrigerate the test stick. Store it in glycerin, which is a baking product and available at grocery stores, if it gets very infrequent use.
- If used every couple of weeks it's ok to put a dilute chlorine solution in it, half a ppm, to help inhibit microbial growth. Just don't let it sit in there for months on end.
- If used regularly, just flow water through it with half a ppm of chlorine and don't let it sit in the sun and heat up.

As an alternative the water sample can be sent to Urbans Aqua or Master for testing, just use a clean container.

[UltraPro Bulletin](#)

[UltraPro Application Guide](#)

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