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A Complete Review On Ultrafiltration and Reverse Osmosis Membrane For Water Treatment Process

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Abstract :

Ultrafiltration and reverse osmosis are most powerful and effective water filtration system.

Through both are the different filtration properties of reverce osmosis and ultrafiltration. The reverce osmosis and ultrafiltration system are Kay difference from mineral retention installation cost maintenance and all system has unique advantage and disadvantage.

The reverce osmosis semipermeable membrane that are seperate 95-98% of inorganic dissolved material from the water molecules.

The ultrafiltration use hollow fiber membrane system to stop microscopic contaminant and solid debris.

It is mechanical filter it is filter water down to the superfine level of 0.025 micron. Hence it is called ultrafiltration.

Keywords : Reverse osmosis, ultrafiltration unit water treatment plant.

Ultrafiltration unit

Principle :- ultrafiltration unit basic operating principle of uses a pressure induced separation of solute from a solvents through semipermeable membrane.Ultrafiltration is a membrane filtration variety in this force like concentration gradient and pressure semipermeable membrane through separation.

Introduction of ultrafiltration unit :

Ultrafiltration technique using to retain colloidal particle,viruses,or large molecule and medium fine enough.

Industries such as pharmaceutical, manufacturing, and chemical or food beverage processing waste water treatment.it utilizes the ultrafiltration process. Ultrafiltration also utilise the blood dialysis. Ultrafiltration is a membrane filtration variety in this force like concentration gradient and pressure semipermeable membrane through separation. The retained in the high molecular weight substance,suspendable solid and solute are called retentate.and low molecular weight solute and water pass through membrane this is called filtrate.

This is seperation technique used as pharmaceutical sterile industry and also used for purifying and concentrating macromolecular solution's reaserch.especially protein solutions.

Ultrafiltration and macrofiltration are fundamentally not a different techniques both are same.both are filtration process seperation on particle captured and size exclusion.

Ultrafiltration process are high cost incurred. Due to replacement of membrane,and membrane fouling.

To prevent membrane unit and excessive damage to required additional pre- treatment of feed water like Multigrade sand filter and activated carbon filter, softner etc.

In sterile pharma ultrafiltration process used in many cases used for the reverce osmosis plant pre-filtration due to protect the reverce osmosis membrane.

Use :

Ultrafiltration use for the removal of macromolecules and particulates from row water and produce potable water.

Advantage and features :

Ultrafiltration technique currently preferred as a traditional treatment method for following reason :

Constant product or feed Quality produces.

Cleaning form aside - no chemical use or required.

Compact plant size.

Regular standered of water quality exceeding of capable.

Pathogen removal of achieving 90 - 100%.

Conclusion :

Reverse osmosis eliminate the majority of the dissolved minerals in the water.most of people prefer reverse osmosis this is because they want their drinking water are pure, free from minerals, salts and total dissolved solid.drinking water as pure as possible.so reverse osmosis is best advantage.

Ultrafiltration is not going to eliminate salts or dissolved solid in water. Ultrafiltration only filter out the solid particulate matter.but it is filter out particulate matter so on a microscopic level.

It has a fine micron reduction capacity.

Ultrafiltration will filter out vast majority of contaminant like sediment, chlorine and cysts.mostly people want to retain minerals like calcium and magnesium in their water so ultrafiltration is advantage.

Reference :

1) Laîné, J.-M.; Vial, D.; Moulart, Pierre (1 December 2000). "Status after 10 years of operation — overview of UF technology today". Desalination. 131 (1–3): 17–25.

2) American Water Works Association Research Foundation ... Ed. group Joël Mallevialle (1996). Water treatment membrane processes. New York [u.a.]: McGraw Hill.

3) Villecco F., Aquino R.P., Calabrò V., Corrente M.I., D'Amore M., Grasso A., Naddeo V. (2020). "Fuzzy-assisted ultrafiltration of whey by-products recovery". Euro-Mediterranean Journal for Environmental Integration.

4) Tamime, A. Y. (12 December 2012). Membrane Processing Dairy and Beverage Applications. Chicester: Wiley

5) Nigam, Mayank Omprakash; Bansal, Bipan; Chen, Xiao Dong (1 January 2008). "Fouling and cleaning of whey protein concentrate fouled ultrafiltration membranes". Desalination. 218 (1–3): 313–3Wile

6) Cheryan, Munir (1998). Ultrafiltration and Microfiltration Handbook. CRC Press.

7) Bruijn, J P F; Salazar, F N; Borquez, R (September 2005). "Membrane blocking in ultrafiltration: A new approach to fouling". Food and Bioproducts Processing. 83 (3): 211–219.

8) Futselaar, Harry; Weijenberg, Dick C. (1 September 1998). "System design for large-scale ultrafiltration applications". Desalination. 119 (1–3): 217–224

9) American Water Works Association Research Foundation ... Ed. group Joël Mallevialle (1996). Water treatment membrane processes. New York [u.a.]: McGraw Hill

10) membrane is designed for MBR systems". Membrane Technology. 2012 (9): 4.

11) Con-Serv Manufacturing. "Operation and Maintenance Manual - UF-6-HF Ultrafiltration System" (PDF). Con-Serv Manufacturing. Retrieved 10 October 2013.

12) Water, Sydney. "Rosehill Recycled Water Scheme - Fairfield Recycled Water Plant"(PDF). Sydney Water.