

S1.2.2 Performance Analysis of 20 Micron Self-Cleaning Disc Filter Versus Cartridge Filters for RO Membrane Protection After Media Filtration in a SWRO System

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This analysis compared the use of traditional 20 micron cartridge filters versus self-cleaning disc filters as a 'safety stage' between media filtration and reverse osmosis (RO) membranes in a seawater desalination systems using RO (SWRO) over a testing period of 5 years. Items of interest for comparison were reduction of disposal costs of used cartridges along with reduced labor costs with the elimination of cartridge disposal, energy cost reductions by decreasing the average pressure loss across the 'safety stage' filter system and finally, effluent water quality differences.

The results show that the self-cleaning disc filters provide many benefits when considered as an alternative to the standard 20 micron cartridges. The disc filters are not a consumable, but a self-cleaning media which eliminates disposal costs and drastically reduces labor costs associated with cartridge replacement. The disc filters are designed to operate with a low clean pressure loss and to self-clean at a set point of 7 PSI resulting in an average pressure loss of 3-4 PSI whereas the cartridge filters have an average pressure loss of 13 PSI. This leads to a reduction of energy costs due to pressure loss. Finally, the disc filters were found to provide superior water quality, providing effluent with fewer total solids, more efficient removal of larger particles, stable effluent quality and better removal of dinoflagellates.