Filtration Solutions, Inc.

Technology Innovation and System Solutions

WRS – Wastewater Recycling System

Membrane Filtration for Wastewater Treatment and Process Fluid Recycling

Membranes, the Reliable Solution

As a barrier technology, membranes offer a simple and reliable approach for solving most oily wastewater problems. Sub-microscopic pores are sized to pass water while rejecting oil and dirt contaminants. For applications where the wastewater is being discharged to drain, tight pore membranes, in the range of 0.005 microns, are selected for maximum oil and dirt retention. In water and aqueous cleaner recycling applications where the objective is water and cleaner reuse, larger pore membranes (0.05 to 0.1 microns) are employed to insure maximum passage of cleaner while still rejecting virtually all of the contaminants that degrade cleaner performance. Since filtration is based on simple mechanical principles, it eliminates the variability often associated with other wastewater processing techniques such as screening, floatation/skimming, and chemical treatment. By using a properly designed membrane and system, the user has the assurance that only the desired molecules will pass through the membrane barrier to achieve the optimum result.

The Hydrophilic Membrane Difference

The WRS System's proprietary membrane will not pass, adsorb or be physically changed by "free" or emulsified oils. Where other membrane materials readily foul in the presence of oils, FSI's membrane filters will continue to perform consistently month after month even during feed stream upset events containing high oil and dirt levels.

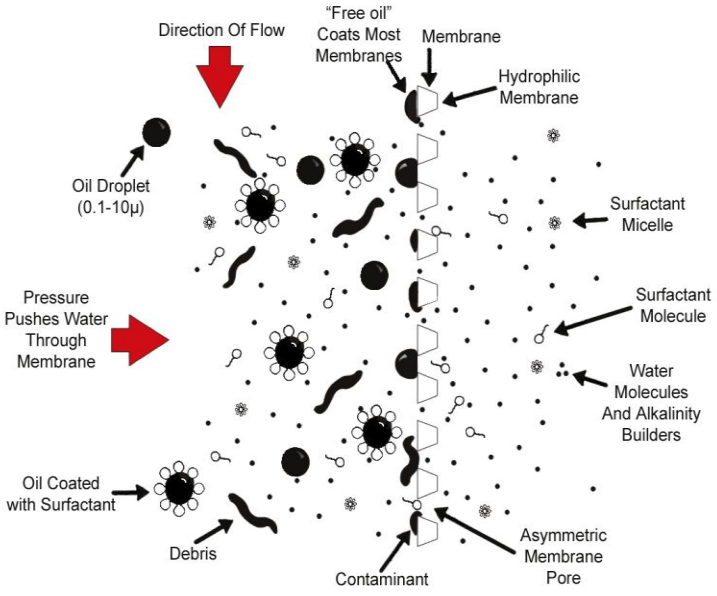
Reduces Waste Volume by >90%

The WRS filtration system, based on advanced membrane technology, is designed to treat oily wastewater, recycle machine coolant and industrial process fluids. The system produces clean water that is typically suitable for reuse or discharge, while concentrating organic and inorganic contaminants down to less than 10% of the original waste volume. For coolant recycling application, the system removes suspended solids, emulsified and free tramp oils, and bacteria while maintaining properties of the recovered coolants for maximum savings.

Multiple Applications!

WRS systems are ideal for applications such as those listed below. What's more, the systems don't have to be dedicated to a single feed, providing users with flexibility to handle an array of waste feeds as they come along.

- Mixed end-of-pipe oily wastewater
- Alkaline cleaners and rinse water
- Machine Coolants
- Compressor blow-down condensate
- Pressure / steam cleaning effluents
- Limonene cleaning fluids
- Mop water
- Rolling, drawing and casting wastewater
- Pigment and ink wash-down



Membrane Filtration

WRS Saves You Money on Any Waste Application!

Choose a Standard System or We'll Custom Design One!

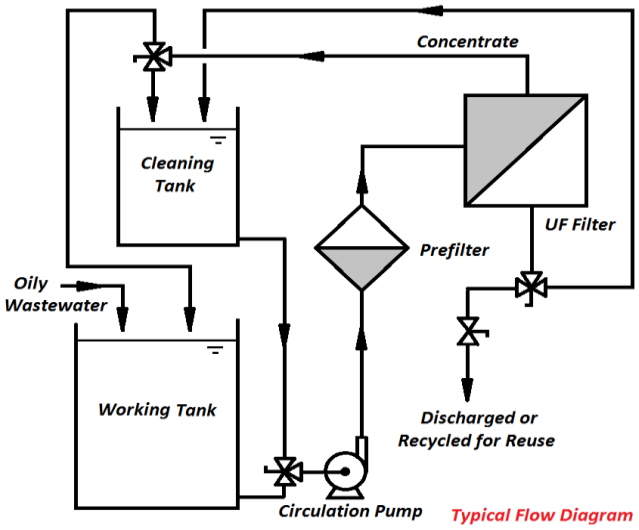
FSI's membrane cartridges are available in a wide range of pore sizes to suit any process requirements. The cartridges also come with various sizes for FSI's WRS product line. WRS-4 is a convenient portable unit with a process capacity of 4 gallons of oily wastewater per hour. WRS-12 is designed as a mobile unit with a built-in prime pump to facilitate the startup of the system in each relocation. Systems with higher process capacities up to 180 gal/hr are built as skid-mount standard units. FSI also offers fully automated systems, which maintain themselves by activating an automatic wash cycle at the end of the batch-down process or at a set point in a continuous processing configuration. Larger systems can be specially designed using FSI's engineering staff.

Easy to Install and Maintain

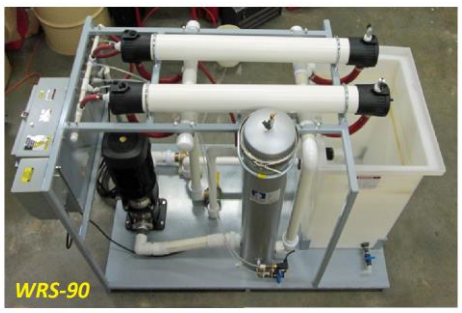
WRS systems are ready as delivered for plug-in operation. All systems include a membrane cartridge (or cartridges) and a prefilter (or prefilters). WRS-12 and larger systems also come with a wash tank for cleaning operation. Since all membranes for WRS are designed to be fouling-resistant, periodic cleaning with a simple detergent is all that is necessary to maintain optimal performance.

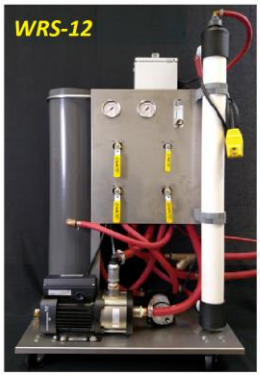
Pay for Itself in Weeks!

The WRS System's ability to reduce waste volumes by more than 90% yields an equivalent savings in the volume of waste being hauled or processed in-house with less effective or expensive evaporators or chemical treatment. Typical payback can be achieved in less than 6 months, and with the System's low annual operating costs, users can achieve meaningful savings from the very first day of operation. If the high cost of waste disposal has made it difficult for you to comply with government effluent regulations, these cost saving system could be the answer that substantially reduces or eliminates your disposal liability.



Typical Flow Diagram





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