

# R<sup>3</sup>ftechnology

## R3F Technology - Product Overview

Finally a product is available that allows the use of fixed contact beds using fine media. Fast kinetics is the key to managing and treating fluids in a quick and effective manner. The faster the kinetics, the smaller the foot print for the process units and the smaller the quantity of the media that must be used to treat the fluid. The smaller the media particle, the more surface area per volume. The result .... exponential improvements in the kinetic reactions that occur on the surface of the media. This is particularly true for surface adsorption media or exchange resins. For filtration media, the finer the media the smaller the particle separation from the fluid being passed through the media. The R3F Technology is a simple and effective vessel design that allows for the use of fine media. Now fine media as low as 10 micron can be used to treat or manage fluids.....and all of this can be accomplished at delta pressures similar to existing down flow or upflow contact media bed systems. The advantage however, is a footprint 20 to 50 % of the size of typical media systems and similar type cost savings.

Through the use of the R3F Technology design, the fluid is managed through one half of the R3F design as a plug flow reactor where the fluid travels from the outside of the column to the inside of the column with a consistent and steady flow characteristic ( plug flow). When there is a need to create a completely stirred tank reactor, the other half of the column can operate in that manner as well.

The latest advancement in the water and waste water industry has been the use of cross flow or membrane filtration (i.e. Micro-filtration, Ultra- filtration, Nano-filtration, Reverse Osmosis). Over the last twenty years, this technology has evolved as a leader in the treatment of fluids. According to a recent American Water Works Association review of emerging technologies, the capital costs for Micro-filtration Cross Flow Membrane technology are approximately \$800 to \$1500/gpm (\$3500 to \$6600 per m<sup>3</sup>/hr) of flow through capacity and the same again for operating costs. Although the market is very comfortable with the use of traditional sand filters at a cost of \$100/gpm to \$300/gpm, the market has accepted that a higher level of treatment is required and is prepared to pay the very high costs of membrane filtration. The R3F Technology, with the use of fine media can now provide the next level of particle separation, at prices equal to or lower than traditional sand or multi media filters.

With the very simple design of the R3F Technology, the costs to manufacture are extremely low. As a result it is a very easy technology to accept into the market place, as it is not difficult to manage the end user pricing such that it is the most acceptable alternative on a cost basis.

The R3F Technology will provide a unique method to create a whole new level of products which use the R3F Technology as an integral part of an overall system and provide the end user with capital and operational cost savings as well as simpler methods to configure and expand treatment systems.