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Process Water Streams - High Solids Removal

Additional submitted attachment is included below.

Process Water Streams – High Solids Removal
Product: SmartFlow Technologies – Tangential Flow Filtration
Representative: MuniQuip - Angie McDaniel

General

SmartFlow Technology allows process stream concentration of high solids, chemical free separation, and eliminates the need for flocculants and diatomaceous earth. This filtration model reduces evaporator operating costs and may also be used in conjunction with other RO filtrations to improve throughput.

Method

The inherent design of tangential flow filtration includes un-optimized flux rates, difficulty cleaning, and nonlinear scalability. SmartFlow patented a design that allows customers to achieve higher yields with lower costs in complex separation processes that are extremely difficult and, in some cases, impossible with traditional filtration products. The design incorporates the use of transverse inlet and outlet ports. With this orientation, the fluid path length is identical for each of the channels in the module. This results in even, precise control of the fluid stream at the membrane surface which produces higher flux rates. Without retentate screens solids don't get trapped in the filter. This improves the filter's ability to produce high solids concentrations which may be used as a source of high quality feed or fertilizer and water can then be recycled back into the process.

Results

- 60-70% wet weight concentrations are not uncommon and solids concentrations beyond 90% have been achieved; 80% to 95% UF recovery of free liquid in most processes
- The open channel format also improves the ability to clean the filter and provides long life in use. The uniform flow also makes it possible to scale the system linearly from the laboratory bench to commercial production.
- High Solids Retentate - retentate may be a concentrated product or process waste
- UF/NF permeate reusable in front of process; or UF/NF permeate fed to conventional spiral RO for high purity water recovery (Note, UF polished feed greatly improves RO throughput)

Conclusion

SmartFlow's patented technology has provided a commercial benefit to the pharmaceutical and biofuels industries since 1989. It is new to food and beverage with current large scale pilots in place with processors throughout the U.S. The modules' distinct characteristics have the ability to create a sustainable solution for California in a time when it's *critical* to conserve water and energy. Presentations are ongoing. Please call Angie McDaniel at (209)365-3541 to schedule.