TIDAL® System

Product Enhancing Forward Osmosis

KOCH™
SEPARATION SOLUTIONS

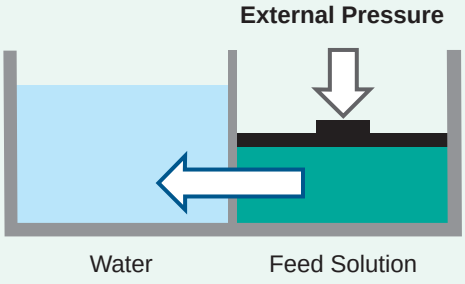
Separation Technologies for a Better Future™

The Challenge

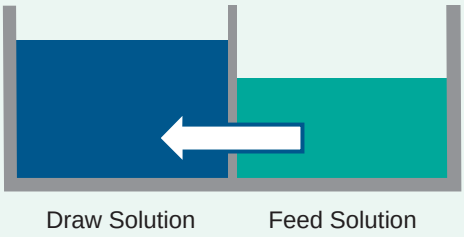
How to Concentrate High Value Products Without Heat Damage

Manufacturers in the Food, Beverage, and Life Science markets are facing increasing challenges to improve the nutritional, organoleptic and functional properties of their products. Production of high concentration ingredients is accomplished primarily by thermal treatment (evaporation) which has the potential to compromise the natural properties and nutritional value of food and beverage products. The products concentrated by thermal processes can suffer browning, off-flavors, loss of aroma and degradation of vitamins and enzymes.

Reverse Osmosis



Forward Osmosis



The Solution

TIDAL® Forward Osmosis Solutions

KSS is pleased to announce the introduction of TIDAL Forward Osmosis (FO) solutions to help manufacturers produce high quality ingredients.

TIDAL Forward Osmosis is a process driven by osmosis – a natural process occurring when solutions of differing concentrations are separated by a semi-permeable membrane. This natural process makes it the “green” version of reverse osmosis (RO) membrane technology. TIDAL Forward Osmosis does not use external forces such as high temperature (the driving force in thermal treatment such as evaporators) or high pressure (the driving force in RO process).

Why Settle for Degraded Product Quality? Go with the Flow!

Like RO, the TIDAL FO process uses a semi-permeable membrane to achieve separation of water from your product. The driving force in the FO process is an osmotic pressure gradient between the feed solution and a solution of high-concentration salt or other molecules (draw solution). In a forward osmosis process the draw solution “pulls” water from the feed to the permeate side, resulting in a very high product concentration beyond the capability of conventional RO technology and without thermal processing that could degrade product quality.

TIDAL Forward Osmosis Technology Benefits

- Due to the gentle processing conditions, organoleptic and functional properties of the product are preserved
- Concentrated juice via an FO process tastes like fresh juice and the aroma of coffee concentrate is maintained
- TIDAL FO can reach high concentrations, higher than conventional reverse osmosis (RO)
- Pressure and heat sensitive materials such as pharmaceuticals and biotechnology products maintain their properties in an FO process
- The TIDAL FO process demonstrates reduced membrane fouling in the presence of organic matter. FO typically requires minimal pretreatment and infrequent membrane cleaning

Natural High Quality Cost Effective Simple

TIDAL® Forward Osmosis Applications

- Concentration of juices (grape, pineapple, various berry juices, orange, tomato and other)
- Concentration of coffee (cold brew)
- Concentration of food colorants
- Concentration of milk and dairy products
- Concentration of pressure and heat sensitive pharmaceutical ingredients

Feed 10 Brix | Final 50 Brix

TIDAL Forward Osmosis

KSS TIDAL Forward Osmosis Elements are available as sanitary and hard overwrap spiral wound elements. Spiral wound construction offers many advantages over other configurations, including simplified system design and cost. Product is available in 8” or 4” sizes to accommodate the complete range of product flow rates. Products are designed to fit in readily available sanitary housings. The elements utilize a high rejection hydrophilic membrane to ensure maximum retention of valuable product components, and minimal fouling.

Small Scale Demonstration

For initial testing and demonstration and quick determination if FO can be the solution to your challenges, we are equipped with bench top and pilot scale FO units. Send us a one-half to one-gallon sample (2-4 liter) for a lab scale test in our labs and we will return processed samples within 2-3 days, or request an on-site demonstration using one of our pilot units.

Full Scale implementation

There are thousands of systems using KSS membranes worldwide. We build systems for a wide range of applications, for different membrane products, with various classes of automation.

Our engineers have developed a line of automatically controlled FO systems to process food and beverage streams from 3 to 50 gpm (1 to 10 m^3/hr). These units are easily scalable to larger flow rates.

We will work with you on the design of your FO solution, ensure successful commissioning of your system, and make certain your staff is well trained to run the FO unit.

Koch Separation Solutions

Koch Separation Solutions (KSS) is a global leader in separation technologies. With best-in-class domain expertise, technologies and systems, KSS is uniquely positioned to help customers purify and recover valuable process streams and achieve sustainability goals across food and beverage, life science, and general industrial markets.

Services & Support

KSS ASSIST™ Service & Maintenance Program • RELCO After-Market Services • SepTrac™ Smart System

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KOCH SEPARATION SOLUTIONS

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For complete contact information and listing of our global locations, visit www.kochseparation.com

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