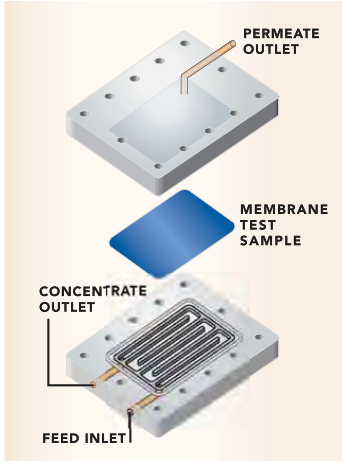


SpinTek STC System

MEMBRANE UNIT



Static Test Cell (STC) Membrane Filtration System

Ultra-small footprint membrane filtration analysis system

Real-time Analysis

The SpinTek Static Test Cell (STC) is a high-shear, high-capacity filtration system that provides valuable time and cost advantages in testing feed solutions and membrane filtration viability. The STC system provides more efficient assessment of membrane suitability for filtering a wide range of liquid products using small volumes of feed solution. The results from the STC can be used to design larger field demonstration systems or assist in the design of full-scale filtration products. In addition, the data developed from the STC system provides a low cost, simple method of screening feed solutions as candidates for membrane filtration.

Ultra-small Footprint

SpinTek's advanced test platform consists of a membrane filtration system, instrumentation and a feed pump. These bench-scale sized systems collect membrane performance data on a wide variety of feed samples. Perfect for evaluating the suitability of micro, ultra, and nanofiltration membranes, the STC module accepts any flat sheet filtration membrane "coupon" that is available in 3" x 4" (75mm x 100mm) size. Each STC membrane test system includes one flat-sheet membrane test sample. The STC accepts polymeric or ceramic membranes. In addition any flat membrane sheet that can be cut into "coupons" can be used in the STC.

Test Platform

KEY BENEFITS

- Small footprint allows operation in cramped laboratory environments.
- Ceramic membranes offer exceptional performance in high temperature, high pH and caustic feed streams.
- Easy to clean
- Easily removable membrane
- High shear for increased flow rates, faster test with less fouling
- Accepts a wide variety of membranes
- Affordable, low cost system
- Allows assessment of waste streams previously considered untreatable.
- STC results can be used to assist in designing larger systems cost effectively.
- Single vendor growth path.



SpinTek STC System



Close up of quick-change membrane unit

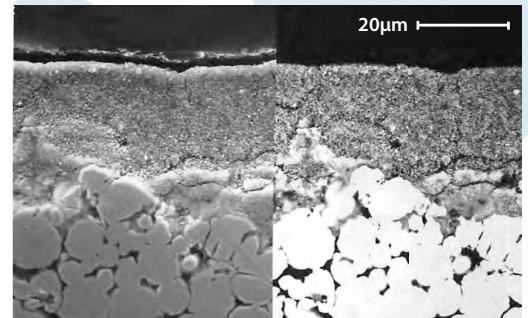
The SpinTek Advantage

SpinTek is an industry leader in the research, development and manufacture of ceramic membranes and high shear filtration systems. SpinTek's advanced filtration systems resist fouling from oily, sludgy, caustic and highly concentrated feed streams. The STC test platform was developed exclusively for laboratories—whether university, private industry or government labs—involved in analyzing membrane filtration viability and feed stream analysis. The STC system's low cost, efficiency and versatility in testing a variety of membranes and streams brings a new level of performance and time savings to the test process.

Membrane Innovation

To improve filtration efficiency in the STC system, SpinTek developed a new ceramic membrane with a pore size range from 0.07 to 0.5 microns for the filtration of high-temperature and/or chemically

aggressive solutions. The membrane has a thin titanium dioxide/alumina/silica dioxide layer on top of a stainless steel substrate. The top membrane coating is 15 microns thick while the lower substrate is 250 microns. The very small size of the nanopowder ceramic produces a smooth-to-the-touch surface that resist the trapping of contaminants within the pores of the membrane.



Electron Microscope view of an 0.2 micron membrane showing the 3 micron size stainless steel particles coated by the nanopowder ceramic layer.

SPECIFICATIONS

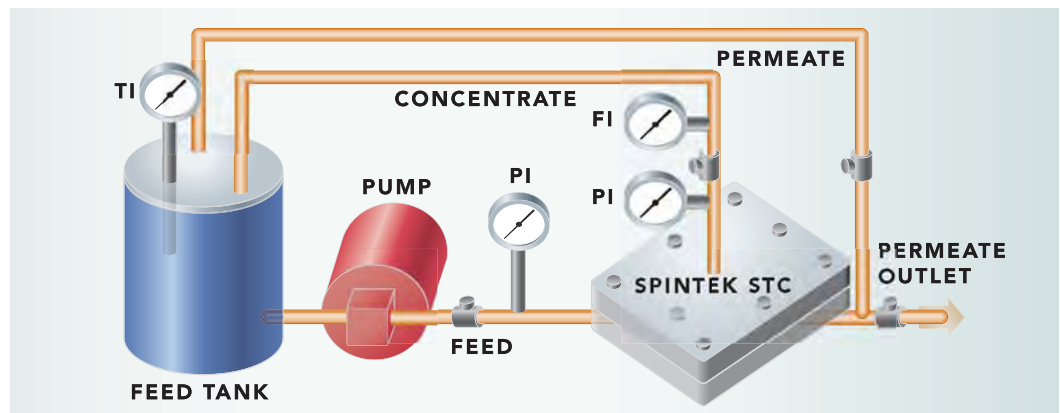
Filtrate Flow Rate*	20 gpd (76 lpd)
Types of Solutions	Oil/Water Separation Caustic Recovery Chemical Separations Biological Separations

*DI water, 50 psig, 75°F, 0.2 micron membrane

System Dimensions	42" l x 30" w x 24" h (1067mm x 762mm x 610mm)
System Weight	600 lb (272 kg)
System Configuration	Feed Tank, Feed Pump, Membrane Filtration Cell, Control Panel

STC PROCESS AND INSTRUMENTATION

Below is a process and instrument diagram (P&ID) of the STC bench-top testing equipment. The process solutions are pumped from the feed tank to the STC membrane system. A variable speed pump is used to control the flow to the system. A backpressure control valve is used to maintain a constant pressure on the membrane system.



Test Platform

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