

Transform

Turn the water you have into the water you want.™

V♦SEP®



“The reasonable man adapts himself to the world; the unreasonable one persists in trying to adapt the world to himself. Therefore all progress depends on the unreasonable man.”

-George Bernard Shaw



In 1987, New Logic was two guys in a garage.

Today V \diamond SEP[®] systems operate in hundreds of facilities on six continents.

In 1987, two entrepreneurs set out to create a new technology company. The idea of creating a multi-million dollar company with humble beginnings was nothing new in the San Francisco Bay Area; after all, Apple Computer had already made history with the personal computer. In New Logic's case, the two guys in a garage were Dr. Brad Culkin and Ric Johnson. Culkin, with his PhD in chemical engineering, was the driving force behind the technology development, while Ric Johnson provided the business acumen.

The early days of the company saw numerous ups and downs, and included licensing deals for a variety of inventions developed by the company. One technology, however, soon eclipsed the others. Originally envisioned as a blood separator, the development of New Logic's Vibratory Shear Enhanced Process (V \diamond SEP) provided an inflection point for the young firm.

Culkin and Johnson decided to go big—they would scale

V \diamond SEP from a one drop liquid separator to a system capable of processing hundreds of gallons per minute. In order to get to the next level, the founders decided they needed a partner that could turn their nascent machine into an industrial scale contender. They found that person in Ric's brother Greg Johnson. Greg had studied chemical engineering in college, but had since turned his sights to construction. As a successful contractor building commercial and residential properties, it took a bit of arm twisting to get him on board with the V \diamond SEP project. Once committed, however, Greg quickly became the primary driving force behind V \diamond SEP's commercialization.

Drawing on their chemical engineering experience, the trio rolled the technology out as a dewatering device for products such as kaolin clay, titanium dioxide and calcium carbonate. Thanks to these early successes, V \diamond SEP was soon adopted by a diverse array of corporations and industries around the world.

“It's the biggest scale-up story in industrial history. From one drop to a million gallons a day.” - Brad Culkin, PhD

As the company grew and changed, so did the membrane industry. Whereas New Logic traditionally deployed V \diamond SEP with microfiltration and ultrafiltration membranes for dewatering applications, newer, more robust nanofiltration and reverse osmosis membranes were being developed for the first time. Armed with these more advanced membranes, V \diamond SEP's patented open channel filter pack design enabled the separation of both suspended and dissolved solids in a single piece of equipment. This point of difference proved to be a game changer for New Logic and its flagship product.

With increased adoption of V \diamond SEP around the world, the demand for ancillary products and services grew proportionally. New Logic responded with additional innovations including fully automated separation systems, spiral-wound reverse osmosis systems, membrane performance chemicals, and more.

Today, New Logic boasts a large customer base with sys-

tems on six continents, but the company is not resting on its laurels. The same entrepreneurial spirit that launched the company over a quarter century ago permeates the New Logic of today. Innovation and an unrelenting customer focus are the touchstones every member of the New Logic team returns to daily. Like the sharks off San Francisco, we must keep moving or perish.



“Any sufficiently advanced technology is indistinguishable from magic.”

- Arthur C. Clarke



Membranes: they're not just for water anymore.

Membranes have been used to remove dissolved solids from water since the 1950's, but today's membranes provide more throughput and better chemical resistance.

Membrane Technology

Membranes allow some things to pass through while rejecting the rest. Thus, any feed stream sent to a membrane system such as V \diamond SEP will be split into two. The part of the stream that can pass through the membrane is called the permeate. The permeate is the "clean water". The part of the stream that is rejected by the membrane is called the concentrate. In a product recovery or concentration context, the concentrate is the desirable material; in a wastewater or product clarification application, the concentrate represents a concentrated slurry of undesirable contaminants.

There are four general classifications of membranes, any of which can be used in a V \diamond SEP.

Microfiltration (MF) membranes are the most porous, with a range of 0.1 μ - 2.0 μ . MF membranes are especially useful in dewatering slurries.

Ultrafiltration or UF membranes come in sizes from 0.008 μ - 0.1 μ , and are used in a variety of V \diamond SEP

applications where the goal is to hold back 100% of the suspended solids. UF membranes will remove large organics such as proteins, pyrogens, bacteria and colloids. UF membranes can also be used in V \diamond SEPs to break emulsions without using chemicals.

Nanofiltration or NF is the newest membrane type—they can be used to remove organics and many dissolved materials such as hardness. NF membranes are often used in wastewater treatment to remove BOD, but can also be used as pretreatment to a RO V \diamond SEP or spiral RO system. The permeate from a nanofiltration membrane is a "soft" water.

Reverse Osmosis or RO is the "tightest" of all the membrane types. RO membranes are designed to hold back sodium chloride (NaCl) and are rated by their ability to do so. For example, seawater desalination membranes are typically rated to reject 99.5% NaCl.

In V \diamond SEP systems, RO membranes are often used to remove organics, trace oil, and trace metals in a single unit operation. RO membranes have been much maligned in the industrial realm due to their high fouling potential. V \diamond SEP's vibration mitigates this risk, thus opening the door to a huge variety of applications where removal of low molecular weight contaminants from a wastewater stream is desired.

Shake, rinse, repeat

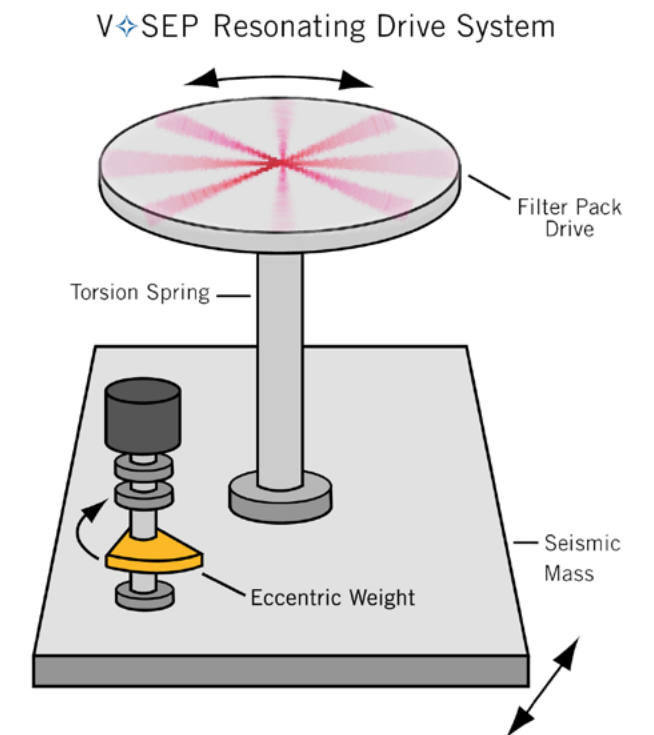
As an R&D engineer with membrane pioneer Dorr Oliver, New Logic founder Brad Culkin saw ample opportunities to improve membrane performance by reducing fouling.

V \diamond SEP[®]

V \diamond SEP is New Logic's first and most important product—the world's first vibrating membrane separation system. By applying vibratory shear waves directly at the membrane surface, V \diamond SEP is able to separate difficult feed streams including high levels of suspended and dissolved solids, oils, organics and other problematic constituents.

Vibration

V \diamond SEP's vibration comes from its one moving part: the eccentric weight bearing. As the bearing spins, the weight induces a vibratory action that is translated to the Seismic Mass. The vibration is sent through the torsion spring and on to the filter pack drive. The filter pack then moves back and forth 54 times per second at an amplitude of 5/8" of an inch (~16 mm). The extreme shear created by the rapid change of direction makes it exceedingly difficult for foulants to attach to the membranes.



To learn more about New Logic's V \diamond SEP technology, visit www.vsep.com/technology



"The manner with which New Logic approaches problems and the unique properties of the VSEP system is a winning combination—an innovative technology from an innovative group of people."

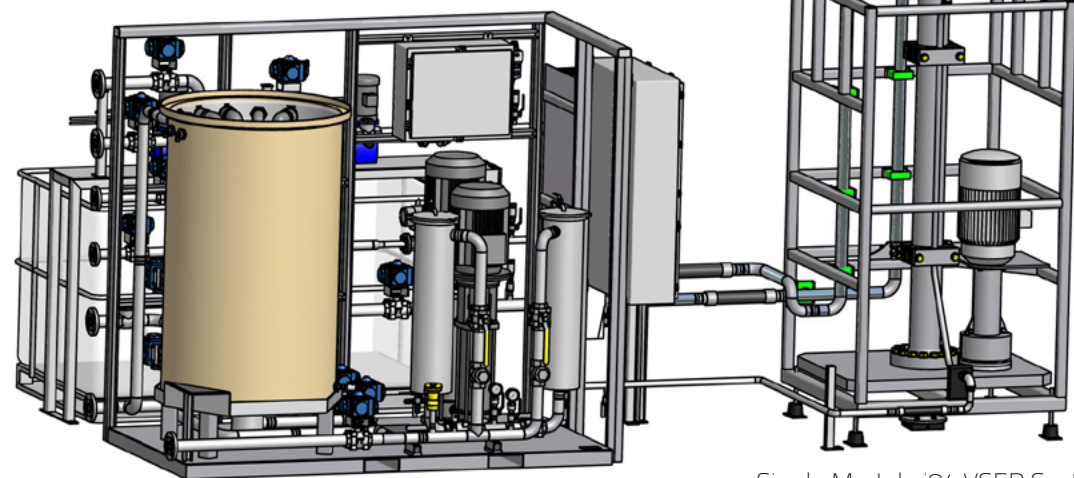
- Leland M. Vane, PhD, US EPA

New Logic's products solve the world's most important separation problems: yours.

Beginning with just one product in 1987, New Logic now offers a complete line of VSEP® separation systems as well as spiral-wound reverse osmosis systems, performance chemicals, engineering, and field services.

Series i

Available in three sizes (i18, i36 & i84) the Series i is New Logic's first and most popular product family. The largest and most commonly used VSEP is the i84—multiple modules of which can be arranged in parallel to meet any flow rate. All Series i systems are available fully automated and require very limited operator interaction.



Single Module i84 VSEP System

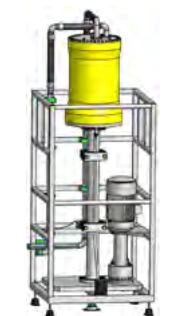
i18

The smallest of the New Logic Series i VSEP line, the i18 is perfectly suited for smaller flows. The available membrane area in the i18 filter pack ranges from 150 ft² to 290 ft².



i36

Between the i18 and i84 lies the i36. A perfect size for high solids applications and moderate flow rates, the i36 was the original workhorse of the Series i family. The available membrane area in the i36 filter pack ranges from 450 ft² to 600 ft².



i84

The most widely used VSEP is the i84. With up to 1400 ft² of membrane area in each filter pack, the i84 is the ideal module size to process larger flow rates. Many i84 system configurations are available, and one is sure to fit your needs.



To learn more about the VSEP Series i, visit www.vsep.com/series-i

“The key to your universe is that you can choose.”

- Frederick Frieseke



LPH, GPM or MGD?

P50

When your flow rates don't justify a Series i, the P50 is often a good choice. Designed to fill the gap between the Series i and the LP, the P50 can process a few gallons per minute, and is perfect for applications such as precious metals recovery and other high value/low flow applications.



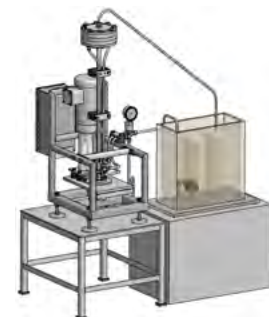
LP

The "LP" in Series LP stands for Lab and Pilot. This innovative V \diamond SEP system can be configured for use in lab mode (0.5 ft² membrane area) or in pilot mode (16 ft² membrane area). Perfect for data gathering and application development, the LP is New Logic's choice for feasibility studies and on-site pilot work.



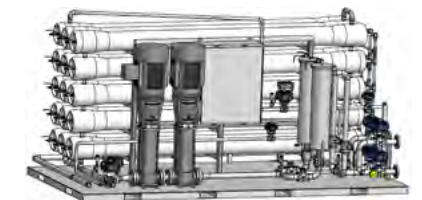
Series B

The smallest V \diamond SEP is the Series B—a scaled down, low pressure version of the Series LP. Designed primarily for demos, the light and quiet Series B is a favorite of our salespeople and manufacturer's reps.



Spiral RO Systems

After years of customer requests, New Logic began making its own spiral RO systems in the early 2000's. Most of New Logic's spiral units are installed in series after a V \diamond SEP system—usually as a final polishing stage prior to surface water discharge or reuse.



There's no shortage of spiral reverse osmosis manufacturers, but unlike the rest, these spiral systems are built to the industrial standards you've come to expect from New Logic. High quality skids, valves, plumbing and automation means you spend less time turning valves and more time enjoying the benefits of a well-designed system.

Batch Titan

Originally designed as a product for in-house use, the Batch Titan membrane test cell has proven equally valuable to an external audience. Use it to quickly and economically screen membranes for their separation qualities or for micro-scale batch concentrations.



Performance Chemicals

Even the most innovative membrane systems need a good cleaning now and then. That's why New Logic developed its own line of membrane performance chemicals in the late 1990's. In addition to membrane cleaners, New Logic also offers a variety of flux enhancers and antiscalants to help keep your V \diamond SEP (or other membrane system) operating at peak performance.



To see the entire New Logic Research product line, visit www.vsep.com/products



"The most serious mistakes are not being made as a result of wrong answers. The truly dangerous thing is asking the wrong questions."

- Peter Drucker

Can we do it?

We've probably already done it.

The number of V \diamond SEP[®] applications grows daily.

Water

All water is not created equal. V \diamond SEP enables you to take advantage of poor source waters.

- Well water
- Drinking water
- Boiler feed water
- Electronics grade water
- Cooling tower feed water

Process

Separations can be difficult and expensive. Reduce costs and process headaches with V \diamond SEP.

- Refining
- Desalting
- Clarification
- Diafiltration
- Concentration

Waste

Avoid regulatory headaches while saving money by treating your waste on-site.

- ZLD
- TSS/TDS
- Organics
- BOD/COD/FOG
- Recycling & reuse
- Sulfates & chlorides
- Selenium/heavy metals

For a full list of applications, visit www.vsep.com/applications

The path forward

From lab test to full-scale start-up in six months

Lab Testing

Send us a sample and we'll prove it works. Visit us to see it work in-person.

With decades of experience, we've probably got data on an application just like yours. We'll use that knowledge to determine if your problem is one we can solve, but because every stream is different, we'll test your sample at our lab to ensure we can give you the separation you need.

Come see for yourself. Send your sample to our headquarters on the shores of San Francisco Bay, then join us for the lab test and see firsthand what V \diamond SEP can do for you.

Pilot Testing

Now that we both know we can do it, let's go on-site and gather more data on a larger volume of feed material.

In an on-site pilot test, we'll use 32X more membrane area and fine-tune the operating parameters while gathering data sufficient for a full-scale design.

Relax—we'll come to you. New Logic has a massive fleet of pilot systems available for the asking. We'll send a V \diamond SEP series LP and a field technician to your site, and we'll have all the data we need in a few weeks.

Engineering

Your team + New Logic = the engineering dream team. Together we custom-design to your needs.

We have a standard design, and you have your preferences. Let's get together and design the ultimate separation system for your facility.

Why dictate when you can collaborate? Your dedicated project manager will guide you through the design process, giving you options along the way and ensuring the feedback loop is always fully operational.

Commissioning

Our field techs come to you to ensure a smooth start-up and train your operators.

It's all come down to this—we're ready for start-up! Just a few short months ago, we were talking about a lab test, and now one of our most senior field techs is on their way to your jobsite for commissioning.

An open channel of communication has yielded a well-designed, fully operational separation system, but we're not done. Now that you're a member of the New Logic family, we'll provide you with a lifetime of free support via phone and email.

Start Today

Answers are just a call or click away.

Contact a friendly Sales Engineer and find out how New Logic can help you solve your most difficult separation challenges.

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