

The global magazine for pump users and suppliers

# PUMP engineer

COVER REPORT:  
Viking Pump continues  
its legacy with innovations  
and expansions

Page 8

Speed 2	1.1 in-hg
Temperature 1	201.0 RPM
	50.2 deg F

300 HP  
DYNO

# VIKING PUMP



Special Topic: Oil & Gas

### In this issue of Pump Engineer magazine:

- End User Interview: BP | Page 12
- EPC Interview: Petrofac | Page 20
- Technical Article: AODD – The advantages over other pump types | Page 24
- Case Study: Oil and Gas | Page 23

Volume 9, April 2017



# Viking Pump continues its legacy with innovations and expansions

*Since 1911 Viking Pump's products have been at the forefront of a variety of applications in multiple industries, from military to food & beverage. Pump Engineer spoke with Derrick Goddard, Interim President, and John Stillman, Distribution Business Line Leader, about the company's recent USD \$1.75 million lab expansion and their innovative product lines that are catered specifically for the oil & gas industry.*

*By Deirdre Morgan, Editor*

---



*Viking Internal Gear Process Pumps at a Chemical Plant.*

There is no doubt that Viking Pump's dynamic history is a testament to its ever-growing success. The company was founded in 1911 by a group of Danish immigrants, Jens Nielsen, P.C. Petersen, W.L. Hearst and George Wyth, and from the outset the company established itself as a leading manufacturer in the oil & gas industry. By meeting the needs of the industry with its ability to transport oil by railroad tank car, Viking Pump experienced an acceleration in growth. From then on the company's products were in high demand. Viking pumps were needed across multiple industries, such as petroleum processing in the 1930s and during World War II for military applications. In 1989 Viking Pump was purchased by IDEX Corporation and is still a vital component of IDEX growth today.

In addition, due to the ever-increasing demand for its products, Viking Pump has had to continually focus on

expansion and innovation in order to meet its customers' needs. In the 1980s it opened a manufacturing facility in Shannon, Ireland and acquired Viking Pump Canada in the 1990s, as well as appointing its first distributor in China. Over the past 17 years, Viking Pump has focused on investing back into its processes and engineering, adding several test stands and new process lines in their manufacturing facility. Most recently, in 2016 the company opened a new research lab, extending its capabilities further to handle in house testing, which complements its engineering prowess and internal foundry capabilities. With such a global footprint it is unsurprising that Viking pumps are used everywhere. "Viking pumps are an essential component in the manufacturing process of many products that can be seen in many aspects of your daily life. From the shampoo used to wash your hair to the foam in the



seat of your car, and even the cream filling in your Oreo cookie, Viking has had an impact across many industries,” says Derrick.

## Trust, team and excellence

The foundation of Viking Pump lies in its core values: trust, team and excellence. These values guide the company’s employees in their management of professional relationships, project collaboration and business decisions. John expands: “Trust relies on keeping commitments, being credible, competent and transparent, as well as acting with candor and compassion. Team embodies winning together with integrity, and supporting diversity and service before self. Excellence emphasizes discipline and focus while making positive impact and continuing a legacy of greatness.” Furthermore, the company not only places their employees in high regards, but also the entire community. Along with other business units of IDEX, Viking Pump prides itself on its engagement with and support of the community, and is proud to have employees globally involved in creating community support programs and projects through its IDEX Foundation. IDEX Corporation launched the “IDEX Foundation” in 2014 to provide funding to organizations in the local communities where we have IDEX locations. IDEX has supported multiple Viking community initiatives such as the Cedar Valley Backpack program that provides supplemental food over the weekends for over 5,000 students in the Cedar Valley school district. In Canada, the IDEX foundation has provided funding for the past two years to a local school breakfast program in Windsor, Ontario. This funding supports breakfast for up to 600 kids throughout the school year. These programs also provide engagement for our employees as they get directly involved by volunteering.

## Utilizing experience to satisfy needs in the oil & gas industry

Viking Pump’s product history tells a lot about its success through the years. From the very beginning innovation played a major role. Derrick explains that one of the founders, Jens Nielsen, had developed a quarry but struggled with water getting in, and so began developing drawings of “a gear within a gear” pump. “With the help of an employee by the name of



*Viking Headquarters on State Street in Cedar Falls, Iowa. This is one of four facilities in Cedar Falls, which also includes an Iron Foundry, Alloys Foundry and Machining/Assembly plant.*

George “Shorty” Mathes, Nielsen built the first ever rotary pump that was patented in 1904,” he says. Now, Viking Pump’s main product line continues to focus on the internal gear technology and includes 16 lines of products designed to provide valuable solutions across many industries. The Universal Mag Drive product provides a sealless, higher leak protection for EPA (Environmental Protection Agency) requirements and the company also offers external gear pump products for higher pressure applications. Adding to this, Viking Pump also has a vane pump line for thin liquids and a full list of aftermarket accessories such as parts and kits, strainers, reducers and motors.

Yet, most noteworthy is Viking’s investment in product lines to support the upstream, midstream and downstream oil & gas industries. “Our XPD 676 pump is the industry’s first fully API 676 compliant internal gear pump,” says John. “Oil, gas and petrochemical plants worldwide select process equipment that conform to API standards to ensure they use only the ultimate in quality, dependability and safety. The XPD 676 Series was specifically designed to be in full compliance with every detail of API’s 100+ pages of specifications on everything from bearing life to magnetic particle testing of welds, to mounting food flatness and parallelity.” Derrick adds that full conformance reduces risk and simplifies project specifications by eliminating sign-offs necessary on non-compliant equipment. Typical applications include offshore oil platforms, oil terminals, oil refineries and petrochemical plants.

However, Viking’s product offering does not end there. They have also built a line of LACT (Lease Automatic Custody Transfer) performance products. These products operate reliably together and allow for a smaller footprint than competitive systems. “Our Booster pump is a compact unit design with hardened internal parts and pressure capabilities up to 1,500PSI,” explains John. “The Charge Pump utilizes Viking’s ability to select the perfect performance match to



*This wooden model was hand carved by Jens Nielsen. Its Gear-Within-A-Gear design was used to solve Nielsen’s water seepage problem and was the foundation on which the Viking Pump Company was founded.*





Viking has two local foundries.

our booster pumps. The Sample/Sump Pumps are compact, low maintenance and very reliable solutions. The Strainers are engineered to LACT unit needs to provide protection and insurance for your system, and the Transload pump was developed and designed to increase efficiencies and reduce loading and unloading time for your operation.” Additionally, Viking Pump prides itself on its ability to customize products for its customers. With the benefit of over 105 years of experience and data to support a broad core offering of products, when the application calls for a unique solution Viking Pump answers. Their engineered solutions enables them to customize products for end users’ unique applications. To support this offering, Viking has a complete machining, assembly, test and packaging facility located in Cedar Falls, Iowa, US, as well as additional manufacturing locations in Canada, Ireland and China. “From a supply chain perspective, we foster key strategic partnerships with suppliers



Viking’s API 676 compliant pump, the XPD 676.

from across the globe to provide materials to all Viking manufacturing locations. These highly successful partnerships are a direct result of the commitment to each other from both our suppliers and various teams within Viking Pump in all locations,” says Derrick.

### **An expansion that ensures maximum efficiency and quality**

With the goal of meeting a high demand across the globe, Viking Pump recently expanded its research lab which is located in its headquarters in Cedar Falls. The expansion was completed in 2016 and represented a USD \$1.75 million investment that added 3800 sq ft. and renovated 1600 sq ft. The lab is equipped with overhead cranes, which are capable of managing the largest of products efficiently, and includes Distek data collection software for the dynamometers that range from 3 to 300 HP. Twenty different test fluids on site represent the many various viscosities and applications Viking supports, including current end user base products, new product research and development and EPC (Engineering, Procurement and Construction) project support. “We also developed a scalable new product development process called Concept to Customer. This staged new product development program outlines research, testing, Voice of Customer, operational and market requirements for implementation of new products. The program has increased our efficiency as well as guided product development and project funnels for research and development,” states John.

### **Additional Capabilities of Viking Pump’s New Lab**

- Hydro Testing
- Vibration Testing
- Noise Testing
- NPSH Testing
- Viscosity Testing
- Specific Gravity Testing
- PH Testing of Liquids
- Elastomer Compatibility with Liquids
- Endurance Testing (long term or short term)
- High Temperature Tests (limited with conditions)
- Vacuum Lift Tests (limited to pump size)
- Witness Testing
- Machining Capabilities
- Water Testing (limited to pump size)
- Unit or Pump Testing
- Pneumatic Leak Tests
- Bearing Temperature Testing
- Pneumatic Motor Testing



In addition to keeping on top of research and development, Viking Pump also needs to ensure that its products and new innovations meet governmental regulations. Its manufacturing processes follow ISO 9001:2008 quality standards while implementing Six-Sigma and Lean Kaizen tools. Also, all products are tested prior to leaving the production cell. “Additional testing, varying by application and product, are also implemented as needed through our new research lab. Finite Element Analysis (FEA) is used to optimize component strength and Computational Fluid Dynamics (CFD) is used to optimize fluid flow through the pump. Statistical tolerance stacking software is used to make sure designs are repeatable and deliver consistent performance from pump to pump,” says Derrick. Not only that, but Viking also offers its customers a variety of testing services, including performance testing of the customer’s actual viscosity, hydrostatic testing, pneumatic testing, NPSHr testing, octave band sound & vibration, liquid samples analysis, non-destructive evaluation (including Mag particle; liquid penetrant) and visual inspection and maintenance. “Testing services enable best possible pump selection for our customer’s liquids and process conditions and provides assurance of pump performance before installation,” adds John.

## Future focus

As Viking Pump has been a key player in the pump industry for many decades, it is important for the company to monitor trends and to stay current with new technologies. Derrick and John outline that they are seeing growth in new biotechnologies, such as bio-based polymers and biofuels, as well as an uptick in quote levels in their midstream oil and gas segment. “We have identified opportunities specifically for oil LACT units in the US and have developed booster pumps providing critical flow of crude oil into regional pipelines,” explains John. “In addition to that, Viking uses Voice of Customer techniques to understand new customer needs and anticipate industry trends. As our customers innovate new products and technologies, we are an active partner in supporting their fluid handling needs.” Viking Pump is focused on best in class products and programs and will continue to endeavour to sharpen their tool box for their distribution channel



Viking’s LACT Performance Products – including a Charge Pump, Booster Pump, Sample/Sump Pump, Transload Pump and High Pressure Strainers – ideal for LACT Skid performance.



Certified performance testing on a sealless magnetically-coupled pump on one of 8 dynamometers in our newly expanded research lab, allows us to test a full range of pump capabilities on liquids at the customer’s viscosity.



Viking internal gear pump in a railcar unloading application.

and customers. Focusing on customer engagement, distribution support and core product development will support their largest goal – growth. “Viking is focused on aligning resources, sales, inside support, engineering and commercial support,” explains Derrick. “Speed with delivery and having local inventory are key components in bringing value to the end user and Viking is focused on strengthening those skills.”

## AT A GLANCE: Viking Pump

Years in business: 106 years

Headquarters: 406 State Street  
Cedar Falls, Iowa 50613 U.S.A.

Core values: Trust, team & excellence

Product offering: internal gear pumps, external gear pumps, vane pumps, duplex fuel oil systems, aftermarket accessories

Website: [www.vikingpump.com](http://www.vikingpump.com)

