FIELD PROVEN
in problem wells, the V-Pump welcomes challenges:

- High sand content
- High gas content
- Slugging wells
- Heavy oil

REDUCE WELL INTERVENTIONS
INCREASE PUMP RERUNS

Transformational Technology for the ESP Industry
The V-Pump is the core of a new, revolutionary type of artificial lift system, the Electric Submersible Contra-Helical Pump (ESCHP). The design provides unique flow characteristics and hydraulic mechanism to generate superior production performance in today's difficult wells, whether the challenge is sand, gas, high viscosity oil or a combination of these. The improved sand performance is accomplished with NO additional sand protection devices downhole.
V-Pump Design Features:

- The V-Pump’s Rotor/stator design replaces ESP’s impellers and diffusers, which wear quickly when pumping sand and frequently gas lock with high gas.
- The open flow design and radically different hydraulic mechanism allows:
  - Greater volumes of sand to pass through than a centrifugal pump.
  - Sand to fall freely through the pump when the pump is stopped (avoid sand plugging).
  - Continued Pumping at high gas fraction without gas locking.
  - The V-Pump to ride through slugging wells, which cause early failures of ESPs and lost production.
- The V-pump has been tested to 120 Hz and is effective over the range of 40Hz –120Hz.
- The robust design includes high strength, stainless and corrosion resistant (CRA) materials and each stage is supported by a bearing assembly to handle thrust and radial loads.
- By using the same housing and connection designs as conventional ESPs, V-Pumps easily replace centrifugal pumps in any ESP string.

V-Pump Operating Features:

- Applications are designed to operate over a wider speed and production range than a single model of centrifugal pump, resulting in fewer pump changes during the life of the well.
- Field proven to handle multiple times more sand than a conventional ESP, which reduces operators’ workover costs (interventions), and lost production.
- Third party tested to 95% GVF illustrating the ability to handle intermittent gas slugs without gas locking.
- Pump can be reversed to flush the pump, clear plugged intakes and pump chemicals down the well.
- Able to produce more than gas lift while eliminating early ESP failures.
- Proven superior durability compared to PCPs for pumping heavy oil in sandy wells.

V-Pump Version 3

Veretek has continually improved the pump since the late 2016 and early 2017 deployments. The pump has been thoroughly redesigned leading to a much more robust pump and improved resistance to erosion and corrosion. The robustness leads to increased life and a greater ability to rerun the pumps, transforming pumps from a consumable to an asset.

Operating Ranges based on speeds of up to 120 Hz (7,200 rpm)

- **V3** (300 series with 3.38” O.D.) 200 bpd – 2,750 bpd
- **V4** (400 series with 4.00” O.D.) 500 bpd – 4,700 bpd
- **V5** (500 series with 5.38” O.D.) 1,000 bpd – 8,000 bpd

*Note: Flow rates above are flow rates through pumps.*