The Rotary Gear Pump system design concept differs from the more common ESP used for artificial lift in that the RGP is a robust high volume, low speed positive displacement gear pump that has the ability to operate throughout ranges untouched with centrifugal pumps, delivers optimal production and does so in a cost-effective manner. Although the RGP connects directly to an ESP production string by replacing only the centrifugal pump component, the operation and functional specifications are significantly different.

Listed are the operating features and advantages of the gear pump over the electric centrifugal pump:

1) Flow is independent of pressure. You can change the flow without upsetting the pump's efficiency - RGPs do not have a "best efficiency point" (displacement is a function of speed)

2) There is no radial thrust transferred to the shaft as you move on the pump curve, no axial or downthrust

3) Lift head abilities up to 10,000 ft

4) The RGP can generate the same pressure (lift) as a pump that is 10% of the equivalent centrifugal pump

5) Wide operating range from 100 to 5,000 bbl/d+. Achieve higher rates by adding additional stages

6) Pump efficiencies > 90%

7) Ability to handle high gas fractions, >50% +

8) Electrically driven with existing ESP Series motors & limited ID wellbores:

   a) Either 2 or 4 pole Induction motors (3600 or 1850 RPM)

   b) Low speed high torque Permanent Magnet Motors (PMM)

   c) 5.5-in, 20 ppf casing (Drift ID = 4.65 in)

   d) 4.5-in, 11.6 ppf casing (Drift ID = 3.87 in)

9) Pump OD = 4.00 inches, stage length = 1 foot

10) Reduced overall length allows landing the intake either in the vertical or Hz wellbore section

11) Flow is directly related to speed (RPM & HZ). If you double your speed, the flow doubles and the pressure capability remains the same

12) Ability to handle low concentrations of sand with alloy hardened gears and treated metals for greater resistance to abrasion and erosion, up to 3%

13) Adaptable to all ESP vendors diameter & bolt pattern

Gear Pump Stages