

ROTARY SCREW PUMP TECHNOLOGY: WHICH TYPE IS FOR YOU?

Buyers of new industrial equipment are increasingly returning to their roots with the shift from centrifugal to screw pumps for their critical applications. Screw pumps, first introduced by Archimedes around 200 BC, are positive displacement machines that offer extensive benefits for pumping fluids across a wide range of pressures and flow conditions. Screw pump manufacturers have made it their mission to produce pumps offering significant advances in fluid handling reliability and energy efficiency.

All positive displacement pumps are volumetric fluid handling solutions that create flow and are flexible to dynamic system pressures. They are the most widely adopted pump technology for reliable, continuous pumping of hydrocarbons with highly variable fluid properties and changing operating conditions.



Single Screw (progressing cavity) Pumps

- › Rotor (eccentric Screw) surrounded by elastomeric or metallic stator
- › Only one shaft seal and bearing

Primary Advantages

- › Flow rates to 1,980 gpm (450 m³/h) and pressures to 350 psig (24 bar)
- › Generate consistent, pulsation-free flow with low turbulence and shear
- › Material selection enables pumping of highly contaminated or high BS&W fluids
- › Handle fluctuating working pressures and variable fluid consistencies

Oil & Gas Applications

- › Crude, condensates, produced water/emulsion transfer
- › Cold heavy oil production with sands (CHOPS)
- › Horizontal and vertical pumps for wet pits/waste pits/sumps
- › Drilling mud conveyance
- › Tank and pipeline stripping



Two Screw Pumps

- › Two intermeshing screws synchronized by timing gears
- › No metal-to-metal contact due to geared link between screw shafts
- › Double suction casing design with balanced hydraulic axial loads
- › Four shaft seals and bearings

Primary Advantages

- › Flow rates to 18,000 gpm (4000 m³/h) and pressures to 1500 psig (100 bar)
- › Can handle corrosive materials, multiphase flows (> 97% GVF), variable fluid consistencies, dry running
- › Ultra-low NPSH and shear

Oil & Gas Applications

- › Barge, tank, railcar loading/unloading
- › Pipeline booster and mainline pumps
- › Wellhead pressure control and gathering of multiphase flows
- › Refinery fluid transfer (fuel, bitumen, asphalt, residuum of vacuum, distillation, desalter tanks)
- › ROSE de-asphalting process
- › Tank and pipeline stripping



Three Screw Pumps

- › Hydraulically balanced single or double suction pumps with three screws
- › Single shaft seal and bearing (also available in seal-free designs)
- › Central-drive rotor with two meshing idler rotors

Primary Advantages

- › Flow rates to 3,300 gpm (900 m³/h) and pressures to 4500 psig (310 bar)
- › Enhanced efficiencies with high fluid viscosities
- › Low noise, vibration and shear at high speeds
- › Low MTBF and maintenance

Oil & Gas Applications

- › Heavy crude oil pipeline service
- › Crude loading and unloading
- › Refinery processes for high temperature and high viscosity products
- › Lubricating oil pumping

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