Hydra-Cell®

Seal-less Pumps

Accurate & Reliable Pumps for Lease Automatic Custody Transfer (LACT) Units

Wanner Engineering, Inc.

Hydra-Cell® Seal-less Pumps for LACT Units

Hydra-Cell Seal-less Pumps provide accurate and reliable custody transfer of crude oil, produced water, and NGL's. They feature a compact design, require minimal maintenance, and are energy efficient.

Hydra-Cell pumps are available in several models to match your requirements for flow capacity, pressure ratings, pump size, and budget. In addition, Wanner Engineering has a fully equipped testing facility to perform witnessed and non-witnessed tests for certification of Hydra-Cell pumps.

A network of local distributors who have vast experience and expertise in the oil and gas industry are ready to assist you in every way. If needed, we can provide system design consultation, site visitations, and operational and maintenance training.

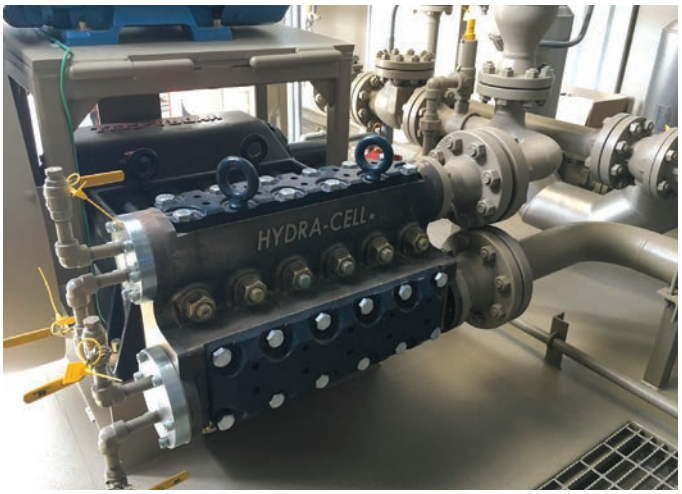
ANAB ACCREDITED MANAGEMENT SYSTEMS CERTIFICATION BODY

ISO 9001: 2015
CERTIFIED

TÜVRheinland®

The Wanner Engineering Quality Management System is certified to the ISO 9001 standard by TÜV Rheinland, an independent third-party registrar. The Quality Management System, which includes the company's Quality Policy and Quality Objectives, is reviewed annually by top management to ensure effective continuous improvement practices and to provide the resources necessary to meet customer requirements with optimal customer satisfaction.

Member of: Hydraulic INSTITUTE



Hydra-Cell pumps were introduced to the oilfields of North America during the early 1980s in Texas, Oklahoma, and Louisiana. Working with a burgeoning network of distributors and agents, Wanner Engineering found success with its Hydra-Cell D10 and H25 model pumps for saltwater disposal service (SWD) in shallow and mid-range oilfields.

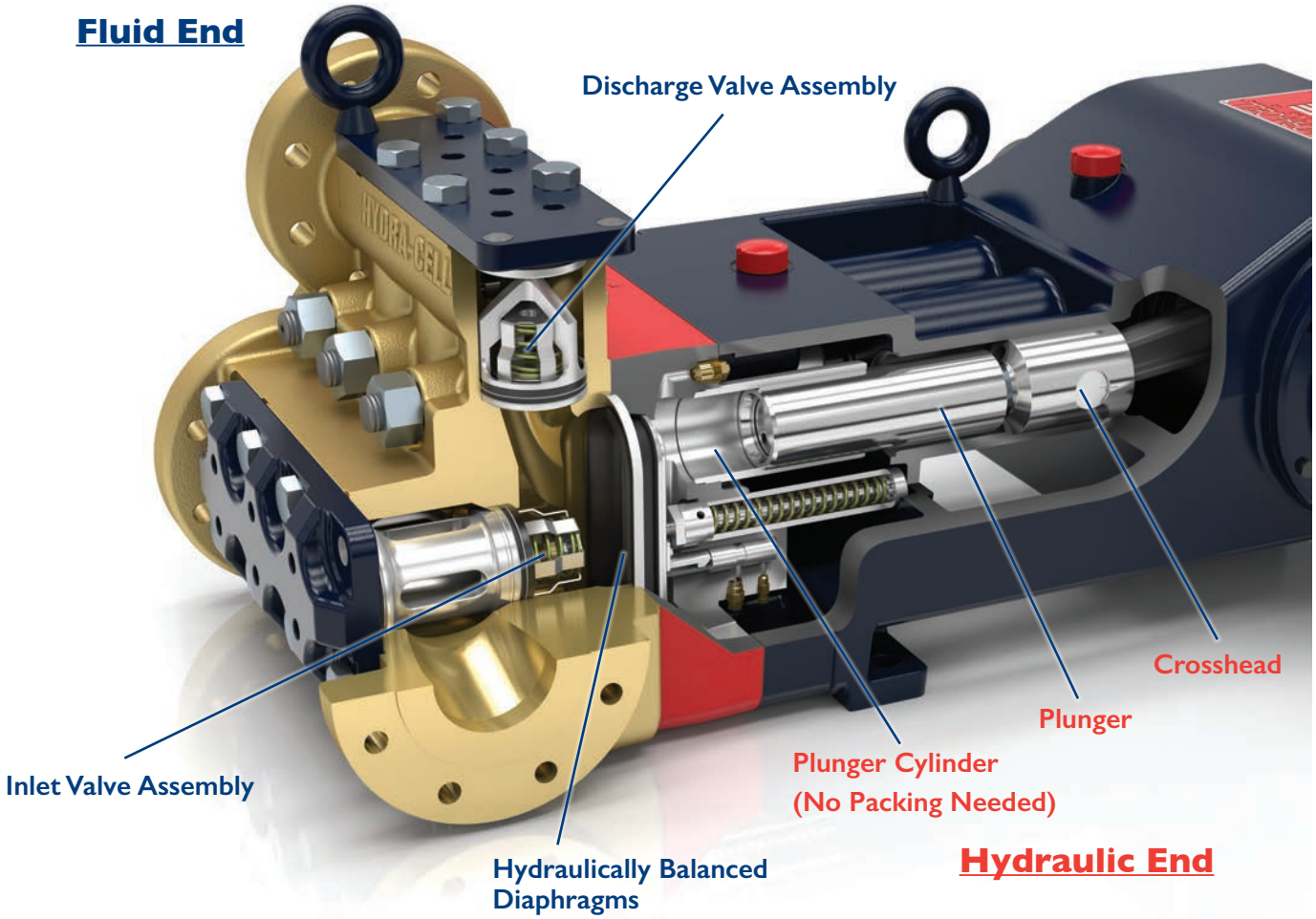
PUMPS DESIGNED & BUILT SINCE 1973 IN THE USA

Oil producers often chose Hydra-Cell because the pumps could sustain high pressure at various volumes, run dry indefinitely without damage, and provide significant energy savings. The lower energy costs are because a Hydra-Cell pump can deliver the same flows and pressures with a lower horsepower motor than other types of pumps.

Hydra-Cell seal-less pumps have since become widely used for crude oil transfer, LACT, SWD, NGL's, TEG, chemical injection and metering, polymer, glycol, hydrochloric acid, methanol, amines, and other hard-to-pump fluids. Today, Hydra-Cell pumps are operating in oil and gas installations worldwide.

Hydra-Cell® Seal-less Design Technology

Hydra-Cell is a multiple diaphragm, positive displacement pump designed and engineered with seal-less pumping technology. The seal-less design separates the power (hydraulic) end from the fluid end. Combined with other Hydra-Cell design features and materials of construction, it provides several performance advantages in the operation of LACT units.



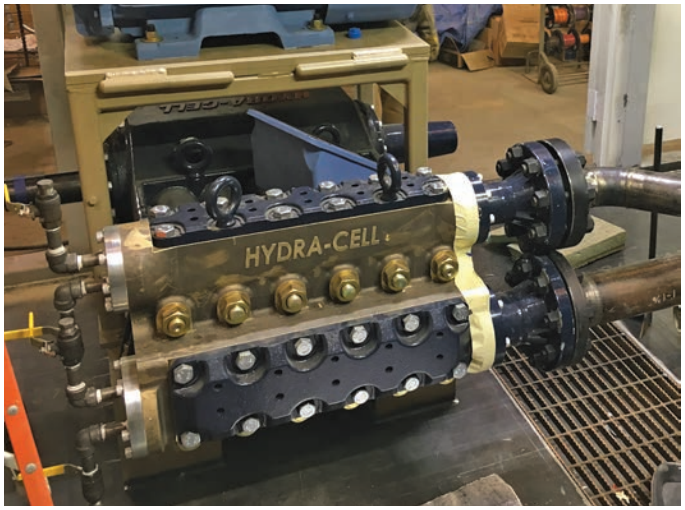
Performance Advantages

- Seal-less design means no packing to leak, replace, or adjust. There is less downtime, less environmental containment costs, and less annual maintenance compared to conventional plunger pumps.
- No mechanical seals to fail, leak, or replace.
- Can pump water-thin fluids without having to adjust the pump speed. The required flow is delivered due to very low slip rates.
- Accurate control of flow rate by varying pump speed over a wide range of discharge pressures and fluid viscosities.
- Handles sand or other solids up to 800 microns in size. No fine filtration is required. No equipment failures when all the frac flow-back sand has not been removed from the well.
- Can run dry indefinitely; the pump does not use the process fluid for lubrication.
- Higher volumetric efficiency than centrifugal pumps and gear pumps when pumping low-viscosity crude oils.
- Alternative materials available for the manifold, valves, and diaphragms if hydrogen sulfide (H_2S) is present.
- Hydraulically balanced diaphragm design for long life.
- Patented diaphragm position control technology protects the pump and enables operation in case of a closed inlet due to abnormal or adverse conditions, or operational error.
- Rugged construction for long life with minimal maintenance.
- Compact vertical V-belt skid design for a smaller installation footprint.

Hydra-Cell® Performance Advantages Compared to Other Types of Pumping Technologies

External Gear Pump Disadvantages:	Hydra-Cell Advantages:
• Mechanical seals and packing require maintenance, and replacement or adjustment.	• The seal-less design of Hydra-Cell means that there are no mechanical seals or packing to leak or replace.
• Fluid pumped must be clean. Does not tolerate solids, abrasives, or particulates. Sand can cause irreparable damage to the pump.	• Seal-less pumping chamber and spring-loaded check valves can pump sand or other solids, abrasive fillers, and particulates up to 800 microns in size.
• Component wear reduces accuracy and efficiency.	• No internal gears to wear so efficiency is more stable and there is less maintenance and spare part replacement.
• Contains four bushings/bearings in the fluid area that require lubrication from the pumped fluid.	• No bushings/bearings in the pumped fluid.
• Fixed end clearances with tight tolerances are typical; hard to avoid "slip" at higher pressures, low-viscosity fluids, or as the pump wears.	• Seal-less diaphragm design does not rely on tight valve clearances that wear and reduce performance.
• Efficiency drops when pumping at lower viscosities. Requires a PID control loop to increase pump speed for different viscosities or as the pump wears.	• Efficiency remains relatively constant over a wide range of low-to-high viscosity fluids.
• Depends on pumped liquid for lubrication.	• Seal-less design does not require pumped liquid for lubrication.

Plunger/Piston Pump Disadvantages:	Hydra-Cell Advantages:
• Packing requires frequent adjustments and then replacement as it wears.	• Seal-less design uses no packing, reducing downtime and maintenance costs.
• Packing must leak to provide lubrication – creating maintenance, containment, disposal, safety, and housekeeping issues with their associated costs.	• No packing means no secondary containment requirements, no clean-up or disposal issues, improved safety, and reduced maintenance costs.
• Packing allows emissions that require expensive "vapor-less" alternatives or vapor recovery systems.	• Seal-less design eliminates emissions and costly associated fines.
• Packing causes plunger and stuffing box wear, which is made worse by abrasive media; the plunger, stuffing box, and packing must be compatible with the product being pumped.	• Diaphragm design allows pumping of abrasive and corrosive media without concern for wear, compatibility, or replacement of packing, stuffing boxes, or plungers.
• May require external lubrication system at an extra cost of up to $3,000 – another maintenance and repair factor.	• No external lubrication necessary, resulting in less mainentance and lower cost of ownership expenses.



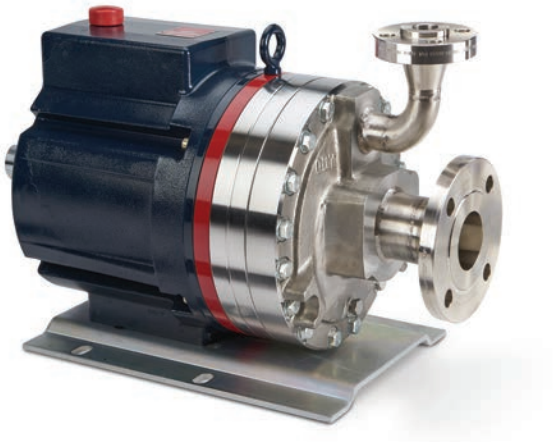
Progressive Cavity Pump Disadvantages:	**Hydra-Cell Advantages:**
• Stator becomes worn by pumping abrasive fluids and is expensive and time-consuming to replace.	• Seal-less diaphragm design can handle abrasives reliably.
• Hydrodynamic film between the stator and rotor cam breaks down under pressure, reducing flow rate and negating true positive displacement pumping action.	• Seal-less pump chamber with hydraulically-balanced diaphragms mean that flow rate is maintained even as discharge pressure increases.
• Cannot run dry.	• Seal-less design enables Hydra-Cell to run dry indefinitely without damage to the pump.
• Higher discharge pressures require additional stages and a larger footprint.	• Can meet the same flow and pressure requirements with a much smaller footprint, saving space as well as investment and operation costs.

Centrifugal Pump (Multi-stage) Disadvantages:	**Hydra-Cell Advantages:**
• Mechanical seals require maintenance and replacement.	• The seal-less design of Hydra-Cell has no mechanical seals or packing to fail and replace.
• Sand and other particulates or fines in the pumped fluid will cause wear in the case, impellers, and mechanical seals.	• Seal-less pumping chamber with spring-loaded disk check valves can pump sand and other particulates or fines up to 800 microns in size.
• Designed to run within a limited flow and pressure range; thrust chamber issues can develop if operating outside the range, such as a sudden pressure drop.	• Designed for efficient, high-pressure delivery at varying flow rates and pressures.
• Running dry and air/gas entrapment can cause catastrophic mechanical seal failure.	• Can run dry indefinitely.
• Ineffective at low speeds and high outlet pressures.	• Runs at low-to-high speeds while maintaining outlet pressures.
• Flow rate is difficult to control effectively; requires a complex VFD control system to stay within the performance curve.	• Positive displacement design allows for accurate speed control, which is directly proportional to the flow rate.
• In case of pressure drop, a choke is often installed to create artificial pump pressure. Since the controller still reads the higher pressure, the pump operates at full horsepower, wasting energy.	• Horsepower used is directly proportional to the system pressure. In case of a discharge pressure drop, less energy is required. Operating costs are lower.
• Higher pressure requires additional stages with an increasing footprint for horizontal pumps.	• Can meet the same flow and pressure requirements with a much smaller footprint, saving space as well as investment and operation costs.

Hydra-Cell® LACT Unit Pump Models

D35 Series

Maximum Flow Rate:	1251 BPD (36.5 gpm)
Maximum Discharge Pressure:	1200 psi (83 bar)
Maximum Inlet Pressure:	500 psi (34 bar)
Maximum Operating Temperature:	250˚F (121˚C)
Maximum Solids Size:	800 microns
Inlet Port:	2-1/2 inch NPT or 150lb ANSI flange
Discharge Port:	1-1/4 inch NPT or 600lb ANSI flange
Pump Head Options:	Brass, Ductile Iron (Nickel-plated) Duplex Alloy 2205 Stainless Steel, 316L Stainless Steel, Hastelloy CW12MW
Dimensions:	20.60" (523.2mm) L x 11.91" (302.5mm) W x 15.11" (383.8mm) H
Pump Weight:	257 lbs. (116.6 kg)



Hydra-Cell D35 with 316L Stainless Steel pump head and ANSI flanges.

D66 Series

Maximum Flow Rate:	2253 BPD (65.7 gpm)
Maximum Discharge Pressure:	700 psi (48 bar)
Maximum Inlet Pressure:	250 psi (17 bar)
Maximum Operating Temperature:	200˚F (93.3˚C)
Maximum Solids Size:	800 microns
Inlet Port:	3 inch NPT
Discharge Port:	1-1/2 inch NPT
Pump Head Options:	Brass, Ductile Iron (Nickel-plated) Duplex Alloy 2205 Stainless Steel, 316L Stainless Steel
Dimensions:	23.47" (596.1mm) L x 14.77" (375.2mm) W x 18.44" (468.4mm) H
Pump Weight:	500 lbs. (226 kg)

Hydra-Cell D66 with Brass pump head.

Hydra-Cell® LACT Unit Pump Models

Available to Meet API 674!

T100 Series

Maximum Flow Rate:	3292 BPD (96 gpm)
Maximum Discharge Pressure:	2100 psi (145 bar)
Maximum Inlet Pressure:	500 psi (34 bar)
Maximum Operating Temperature:	180˚F (82.2˚C)
Maximum Solids Size:	800 microns
Inlet Ports:	3-1/2 inch Class 300 RF ANSI flange
Discharge Ports:	2 inch Class 900 RF ANSI flange
Manifold Options:	Nickel Aluminum Bronze (NAB), Duplex Alloy 2205 Stainless Steel, 316L Stainless Steel, Hastelloy CX2M
Dimensions:	43.00" (1092.2mm) L x 29.11 (739.4mm) W x 19.44" (383.8mm) H
Pump Weight:	1100 lbs. (499 kg)

Hydra-Cell T100 with 316L Stainless Steel manifold and ANSI flanges.

Available to Meet API 674!

Q155 Series

Maximum Flow Rate:	5383 BPD (157 gpm)
Maximum Discharge Pressure:	2100 psi (145 bar)
Maximum Inlet Pressure:	500 psi (34 bar)
Maximum Operating Temperature:	180˚F (82.2˚C)
Maximum Solids Size:	800 microns
Inlet Ports:	Weld Neck 4 inch / SCH. 40
	4 inch NPT
	4 inch Class 300 RF ANSI flange
Discharge Ports:	Weld Neck 3 inch / SCH. 80
	3 inch NPT
	3 inch Class 900 RF ANSI flange
Manifold Options:	Nickel Aluminum Bronze (NAB), Duplex Alloy 2205 Stainless Steel, 316L Stainless Steel, Hastelloy CX2M
Dimensions:	42.94" (1090.7mm) L x 44.76 (1136.9mm) W x 20.62" (523.7mm) H
Pump Weight:	1700 lbs. (771 kg)

Hydra-Cell Q155 with NAB manifold.

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Seal-less Pumps

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