



Reliable Pumps for High-pressure Cleaning with Superior Handling of Abrasives and Particulates



High-pressure Cleaning



Spraying Clean, Recycled & Gray (Reuse) Water, Chemicals, Hot Liquids & Solvents

Compact, Seal-less Pumps for Reliable Operation and Long Service Life

With more than 40 years of experience serving many different industries, including major global companies, Hydra-Cell® pumps are performance-proved for reliable and durable operation in difficult applications that destroy lesser pumps. Hydra-Cell pumps require minimal maintenance, provide energy-efficient operation, and can run dry indefinitely, all resulting in a low total cost of ownership.

Advantages of Hydra-Cell:

- Variety of models, wide range of capacities and ratings, plus extensive choices in materials of construction make Hydra-Cell ideally suited for high-pressure cleaning applications.
- Accurate and easy-to-control because the flow rate is proportional to the pump speed.
- Pumps the full spectrum of low-to-high viscosity fluids.
- Seal-less design can tolerate abrasive solids and particulate matter of up to 800 microns in size depending on pump model.
- Operational efficiencies reduce energy costs.
- Able to run dry without damage (or additional maintenance) to the pump in case of accident or operator error.
- Tolerates non-ideal operating conditions.
- Minimizes maintenance and downtime because there are no dynamic or mechanical seals, cups, or packing to leak or replace.
- Multiple-diaphragm design for most Hydra-Cell models minimizes pulsations (without the use of expensive pulsation dampeners) to minimize pipe strain, reduce acceleration/friction losses in the suction line, and enhance operating safety.



Hydra-Cell pumps are used in car washes for high-pressure cleaning and for pumping clean or reclaim water.

Hydra-Cell Pumps Selection and Applications

Hydra-Cell positive displacement pumps are available in several models to cover a wide range of flows and pressures in different applications.

Ten (10) Hydra-Cell seal-less pump models are ideal for transfer, spraying, and pressure injecting and mixing.



Seven (7) Hydra-Cell T&Q Series pump models are designed for higher flow capacities and greater pressure ratings.



Hydra-Cell pumps are used to provide high-pressure cleaning for many different industries.

- Chemicals (Latex Transport Tankers, Paint Containers, Gas Turbine Nozzles)
- Electronics (PCB Boards)
- Fleet Service (Engines, Exteriors)
- Food Processing (Lance Systems, CIP Systems, Inline Conveyers, Tankers)
- Graffiti Removal (Water, Detergent & Special Sand Mixture)
- IBC Cleaning (Lance Systems, Containers, Totes, Crates)
- Marine (Boat Wash-down)
- Metal Surface Preparation (Under Emersion of Phosphate Solutions)
- Metalworking (Parts Degreasing, Deburring, Decarbonizing)
- Mining (Conveyors, Filter Press Cakes)
- Paper & Pulp Mills (Shower & Felt)
- Steel (Strip Steel, Rollers)
- Vehicles (Touch-less Arc, High-pressure Lance for Car Wash, Trucks, Trains)



Typical Liquids Pumped	Challenges in Pumping	The Hydra-Cell Advantage
Cleaning Chemicals (Acids, Caustics, Detergents)	Aggressive and corrosive.	- No dynamic seals to corrode so aggressive liquids can be pumped reliably. - Corrosion-resistant liquid end materials available.
	Non-lubricating.	No dynamic seals that need to be lubricated by the process fluid.
	Escaping fumes can be unpleasant or hazardous.	Seal-less pumping chamber has no leak path and provides full containment of vapors and fumes.
	Undissolved solids can be abrasive.	Seal-less design and spring-loaded, horizontal disk check valves can handle abrasive, un-dissolved solids up to 800 microns in size (depending on pump model).
Fresh (Clean) Recycled or Re-use & Gray Water	Solid particles may be present from poorly attended pre-filtration.	Seal-less design and spring-loaded, horizontal disk check valves can handle abrasive, un-dissolved solids up to 800 microns in size (depending on pump model).
	Non-lubricating.	No dynamic seals that need to be lubricated by the process fluid.
	Running dry by accident or operator error.	Can run dry without damage to the pump.
	Hard water can form build-up (scale) and wear dynamic seals.	No dynamic seals to leak, wear or replace.
Hot Liquids	Problematic for pumps with tight tolerances and/or dynamic seals.	No tight tolerances or dynamic seals; can operate at extreme temperatures with no detriment, permitting shorter cleaning cycles.
	Food industry requires water at least 194°F (90°C) which is 64-times more corrosive than water at 86° (30° C).	No dynamic seals to corrode or be affected by differential expansion.
Solvents (Acetone, Alcohols, Ammonium Hydroxide, Ketones, Toluene, Trichloroethylene)	Typically non-lubricating.	No dynamic seals that need to be lubricated by the process fluid.
	Escaping fumes can be unpleasant or hazardous.	Seal-less pumping chamber has no leak path and provides full containment of vapors and fumes.



Hydra-Cell installation for cleaning paint containers.



Washing component parts for a US automotive manufacturer.

Lower Initial Investment and Lower Energy Costs

Uses lower hp motors

- Although both pumps have the same pressure rating, the lighter, more compact Hydra-Cell has a higher flow rating while requiring a less expensive, lower hp motor. This means Hydra-Cell saves approximately 30% to 55% on initial costs.
- The multiple-diaphragm liquid head of Hydra-Cell also allows a less expensive, energy-saving motor to be used.



Hydra-Cell metering pump

Weight: 83.5 lbs. (with motor)

Rated: 2500 psi at 36 gph

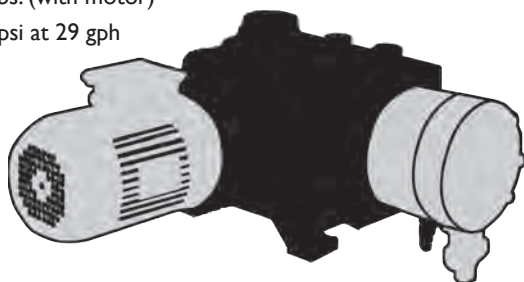
Motor: 1-1/2 hp

Conventional metering pump

Weight: 220 lbs. (with motor)

Rated: 2500 psi at 29 gph

Motor: 5 hp



Low power consumption - 85% to 90% energy efficiency

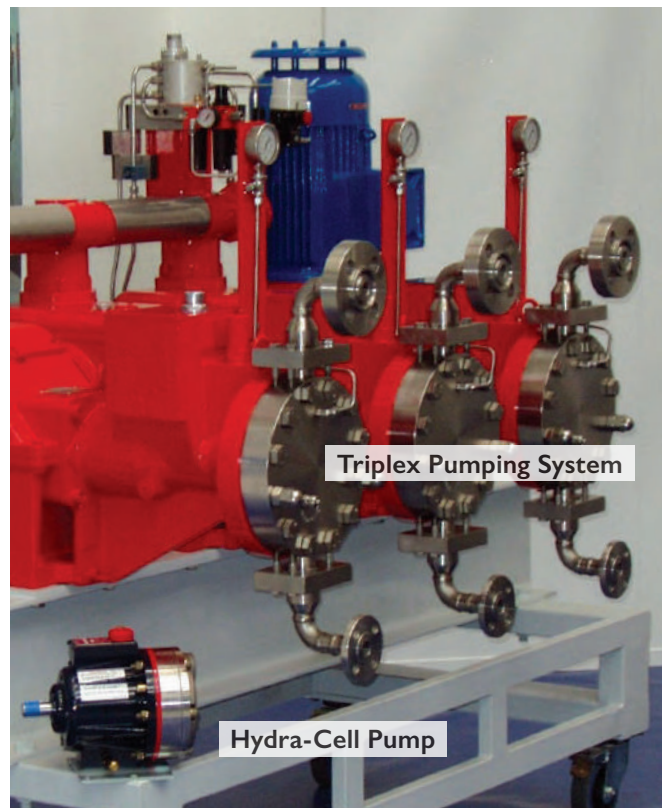
- The lower hp requirement of the Hydra-Cell pump achieves the same performance but with greater energy efficiency and less power consumption.
- Hydra-Cell positive displacement pumps show significant energy savings when compared to screw pumps and multi-stage centrifugal pumps (notably in cleaning and transfer applications).



High-pressure shower application for Hydra-Cell at a paper mill.

Small footprint for savings

- Compact design can mean up to 30% lower initial cost compared to other pumps.
- Space-saving design creates a smaller footprint for more efficient use of plant space.
- Easier to access for routine maintenance or servicing.



Pumps Shown to Scale

The Hydra-Cell and triplex metering pumps both have the same flow capacity and pressure rating; however, space-saving Hydra-Cell has a much smaller footprint. Conventional metering pumps can become oversized and overpriced at higher flow/pressure requirements.

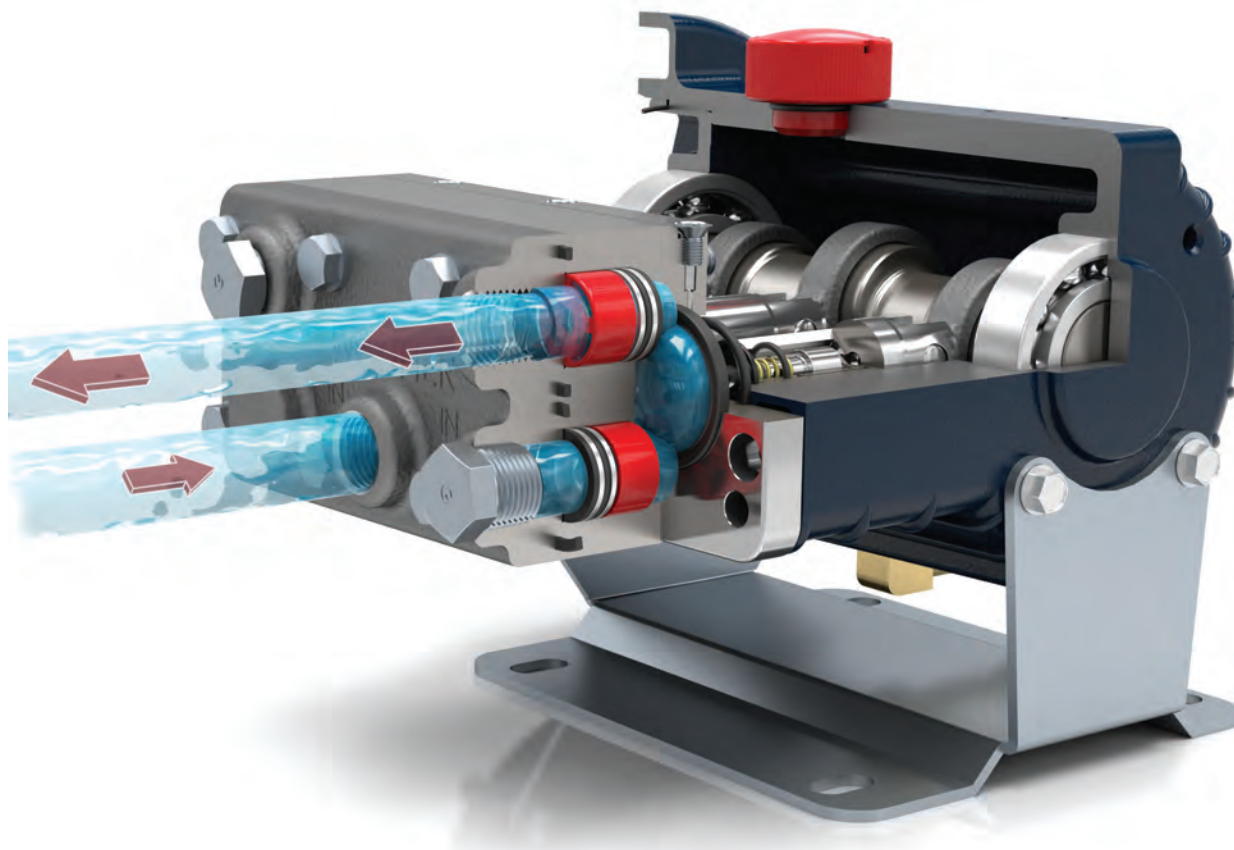
Ratings

Flow:	396 gph (1500 lph)
Pressure:	1160 psi (80 bar)

Minimal filtration

- Unlike gear pumps and screw pumps that wear excessively without fine filtration, Hydra-Cell has no dynamic seals or tight tolerances that need protection by fine filtration.
- Seal-less design handles abrasive particles up to 800 microns in size (depending on pump model) and up to 9 hardness (out of 10) on the Mohs scale.
- Can pump liquids with non-dissolved solids up to 40% depending on particle distribution.
- Unaffected by lapses in filtration, reducing costly pump repairs.
- Less need for costly filtration management and maintenance.

Pumps Abrasives and Low-to-High Viscosity Fluids



Undissolved solids in chemicals and poorly filtered water can clog or damage many types of pumps. Hydra-Cell's seal-less design and horizontal check valve orientation will handle abrasives and particulates without clogging or damaging the pump.

Handles abrasives and particulates

- Seal-less design and spring-loaded, horizontal disk check valves provide superior handling of un-dissolved solids, abrasive fillers, and particulates.
- Efficiently pumps detergents with special sand mixtures.

Runs dry without damage

- Running dry can damage or destroy gear pumps and screw pumps, requiring costly repairs or pump replacement, and resulting in lost production. Hydra-Cell pumps can run dry without damage to the pump.
- When an interruption in flow is caused by suction blockage or a valve closure, gear pumps and screw pumps can fail immediately. Hydra-Cell pumps equipped with patented Diaphragm Position Control (DPC) technology will not be affected, allowing for correction of the interruption.

Full containment and protection

- Seal-less pumping chamber provides 100% containment of liquids from the atmosphere.
- No leak path for toxic or irritating vapors from chemicals or solvents.

Designed for high-pressure operation

- Compact Hydra-Cell F/M/D/H Series pumps with metallic heads have maximum discharge pressures ranging from 700 to 2500 psi and maximum inlet pressures of 50, 250, or 500 psi depending on pump model.
- Hydra-Cell T Series pumps can achieve maximum discharge pressures from 1500 to 5000 psi with maximum inlet pressures of 500 psi.
- Hydra-Cell Q Series pumps can achieve maximum discharge pressures from 1500 to 3500 psi with maximum inlet pressures of 500 psi.

Handles low-to-high viscosity fluids

- Pumps thin to highly viscous liquids throughout the entire pressure range.
- Low-shear pumping action makes Hydra-Cell ideal for pumping and protecting shear-sensitive polymers.
- Non-lubricating liquids can be pumped reliably.

Electronic Control and Pulse-free, Linear Flow

Accurate electronic flow control

- Compared to pumps that rely on manual stroke adjustment or expensive actuators to change flow, Hydra-Cell pumps utilize speed control for greater accuracy throughout the turndown range.
- Can be equipped with solid-state electronic flow control where the volume per every stroke is constant and a known value.
- Electronic flow also provides easy calibration of the desired feed rate and a near instantaneous rate of change (0 to maximum rpm in 0.3 seconds).

Virtually pulse-free flow

- Multiple-diaphragm design minimizes pulsations, eliminating the need for expensive pulsation dampeners for most Hydra-Cell models.
- Reduces pipe strain.
- Enhances operating safety.
- Minimizes maintenance.
- Reduces acceleration/friction losses in the suction line.
- Provides linear, constant flow.
- Lowers system acquisition costs.

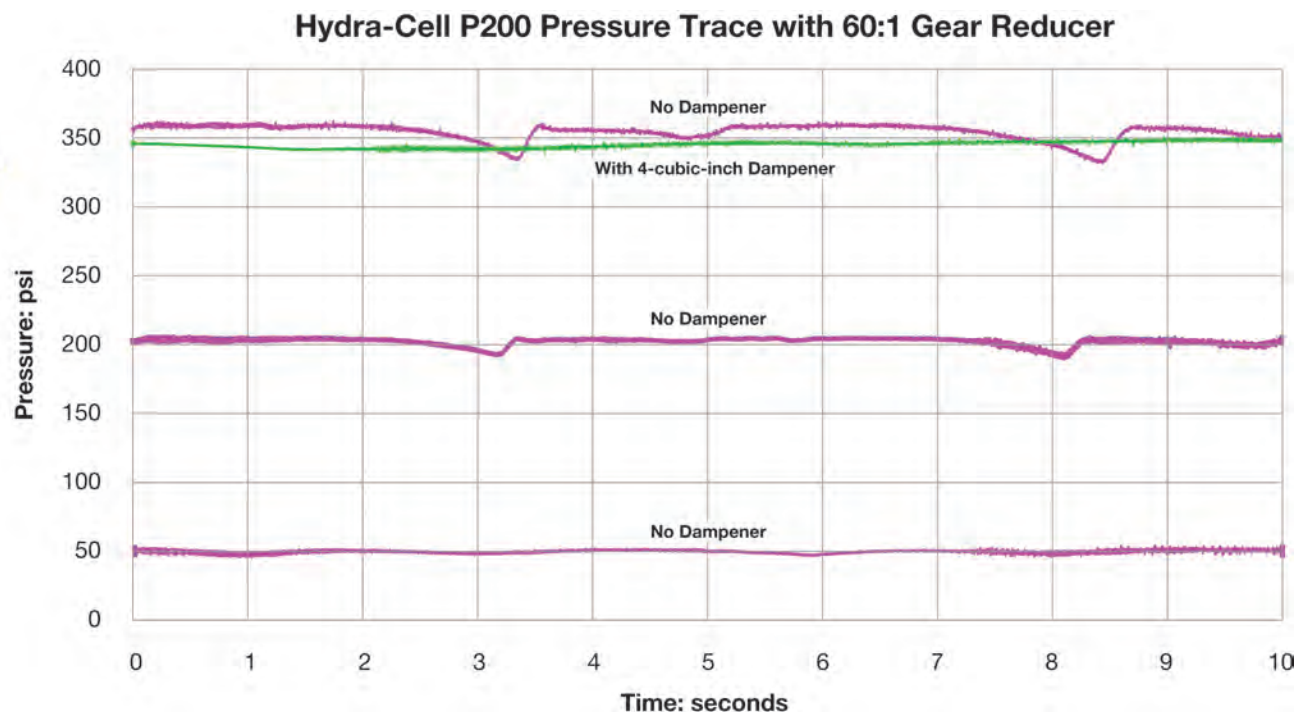
Hydra-Cell Pumps Meet or Exceed API 675 Performance Standards

Steady-State Accuracy:	±1%
Repeatability:	±3%
Linearity:	±3%

Typical results for recommended speed range.



Hydraulically-balanced with a multiple-diaphragm design, Hydra-Cell pumps provide virtually pulse-free flow without the use of expensive pulsation dampeners.



Select Hydra-Cell seal-less pumps are adapted for specific use as metering pumps. The graph above shows the minimal pulsations of a Hydra-Cell metering pump, which is also true of all multiple-diaphragm Hydra-Cell seal-less pumps.

One Versatile, Low-Maintenance Pump Design

Adaptable to many applications

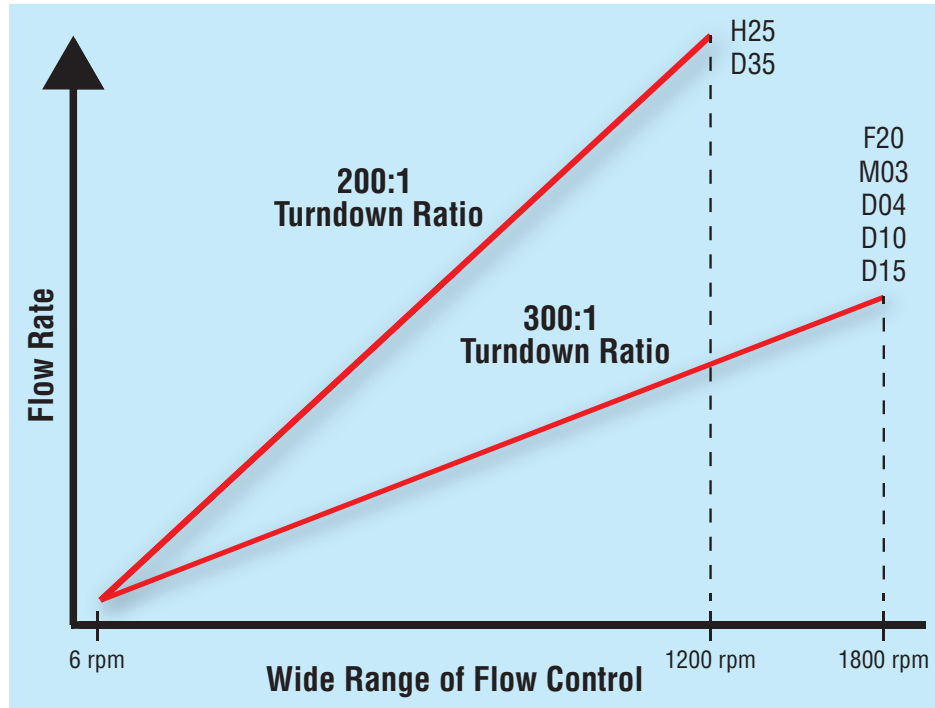
- One Hydra-Cell design applied to a large selection of models covers a wide range of operating flows and pressures.
- Can be fitted with ANSI, SAE or DIN flanges, IEC or NEMA motor mounts, or provided with necessary certification to adapt to specific applications or meet international standards.
- Proven record of replacing different pump technologies with improved abrasives handling, less maintenance, and other benefits (as detailed on pages 8-9).
- Designed for continuous or intermittent use.

Extensive operating range

- Shaft speeds from 6 rpm to 1800/1200 rpm, yielding a 300/200:1 turndown ratio.
- Maximum discharge pressures from 700 to 5000 psi.
- Maximum flow rates from 1 to 157 gpm.
- Minimum flow rates less than 0.15 gph at approximately 6 rpm.

Simple pump head design

- Liquid head materials can be changed readily, enabling Hydra-Cell to be used for many different chemicals and liquids pumped.
- Minimal maintenance required with no special tools needed.
- Low cost of spare parts.



	Minimum	Maximum
Flow Rate	0.0025 gpm (0.15 gph)	37 gpm (2220 gph)
Discharge Pressure	0 psi	2500 psi

Low maintenance

- No mechanical seals, cups or packing to leak, wear, or replace.
- No tight tolerances that could be susceptible to corrosion or damaged by solid particles.
- One design for all applications minimizes the need for standby pumps and spare parts, which optimizes training and service expertise and reduces inventory size and expense.
- Since there are no dynamic seals to wear or replace, Hydra-Cell pumps need little maintenance and will operate reliably under continuous duty at high pressure.
- Any maintenance or repair can usually be performed on-site.
- Can operate up to 6,000 hours between lubricating oil changes (compared to 1,500 hours recommended by many piston pump manufacturers).



Hydra-Cell® Performance Advantages Compared to Other Types of Pumps

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 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 or plunger/piston.
May require external lubrication systems at an additional cost of up to \$3,000 – another maintenance and repair factor.	No lubrication necessary, resulting in less maintenance and lower cost of ownership expenses.

High-speed Centrifugal Pump Disadvantages:	Hydra-Cell Advantages:
Double mechanical seals are expensive and require a fluid barrier system.	The seal-less design of Hydra-Cell means that there are no mechanical seals or packing to leak or replace.
Particulates and fines in the pumped fluid will cause wear in the case and the impellers.	Seal-less pumping chamber with spring-loaded, horizontal disk check valves can pump particulates and fines up to 800 microns in size (depending on pump model).
Difficult to maintain high efficiency while varying flow rate or outlet pressure.	Designed for efficient delivery at varying flow rates.
Running dry and air entrapment can cause catastrophic mechanical seal failure.	Can run dry without damage to the pump. Entrapped air does not cause immediate failure.
Ineffective at low flow rates and high outlet pressures.	Runs at very low speeds and flow rates while maintaining outlet pressures.
Flow rate is difficult to control effectively.	Positive displacement design allows for accurate speed control.
Higher pressure requires additional stages with an increasing footprint for horizontal pumps.	Can meet same flow and pressure requirements with a much smaller footprint, saving space as well as investment and operation costs.

High-speed Pitot Pump Disadvantages:	Hydra-Cell Advantages:
Mechanical seals require maintenance, replacement or adjustment.	The seal-less design of Hydra-Cell means that there are no mechanical seals, cups or packing to leak or replace.
Seal failure will vent product to atmosphere, which is far from ideal for aggressive products (caustic or solvents etc.).	Seal-less pump chamber provides 100% containment; there are no dynamic seals to leak or replace.
Runs at high speed resulting in high energy costs.	A true positive displacement pump that provides high efficiency with low running costs.
Efficiency decreases with increasing pressures or flow rates.	Efficiency remains relatively constant over the entire range of operation.
Runs with a continuous liquid bypass.	Flow rate is directly proportional to pump speed (rpm) and can be set to any desired point within the operating range to offer maximum efficiency and minimum energy usage.
Little choice for materials of construction.	Available in a wide wide range of construction materials to suit most applications and conditions.



Hydra-Cell D15 model pumps used for high-pressure wash down at a meat processing plant.



Hydra-Cell D35 model pumps used at a manufacturing facility for the removal of welding slag and cleaning of a conduit pipe.



Conveyor cleaning at a cereal production plant with Hydra-Cell pumps.



Hydra-Cell used for high-pressure cleaning in a poultry processing plant.

Hydra-Cell Positive Displacement Diaphragm Pumps are Ideal for Handling Abrasives and Particulates



Hydra-Cell®
Seal-less Pumps

- Unmatched versatility and reliability for pumping required in high-pressure cleaning applications throughout many industries.
- Features a seal-less design and horizontal disk check valves that enable the pump to handle abrasives and particulates that might damage or destroy other types of pumps.
- Simple, compact design reduces initial investment and lowers maintenance costs.
- Selection of models that can operate with very low to very high flow rates and discharge pressures up to 2500 psi.
- Available in a wide range of pump head materials of construction and diaphragm materials.
- Variety of options and accessories to optimize performance.

Flow Capacities and Pressure Ratings

Model ¹	Maximum Capacity gpm (l/min)	Maximum Discharge Pressure psi (bar)		Maximum Operating Temperature F (C) ³		Maximum Inlet Pressure psi (bar)
		Non-metallic ²	Metallic	Non-metallic	Metallic	
F20	1.0 (3.8)	350 (24)	1500 (103)	140° (60°)	250° (121°)	250 (17)
M03	3.1 (11.7)	350 (24)	1200 (83)	140° (60°)	250° (121°)	250 (17)
D04	2.9 (11.2)	N/A	2500 (172)	N/A	250° (121°)	500 (34)
D10⁴	4.3 (15.1)	N/A	1500 (103)	N/A	250° (121°)	250 (17)
D10	8.8 (33.4)	350 (24)	1000 (69)	140° (60°)	250° (121°)	250 (17)
D12	8.8 (33.4)	N/A	1000 (69)	N/A	250° (121°)	250 (17)
D15 & D17	15.5 (58.7)	N/A	2500 (172)	N/A	250° (121°)	500 (34)
H25	20.0 (75.9)	350 (24)	1000 (69)	140° (60°)	250° (121°)	250 (17)
D35⁵	23.1 (87.5)	N/A	1500 (103)	N/A	250° (121°)	250 (17)
D35	36.5 (138)	N/A	1200 (83)	N/A	250° (121°)	500 (34)
D66	65.7 (248.7)	250 (17)	700 (48)	120° (49°)	200° (93.3°)	250 (17) ⁶

¹ Ratings are for the cam design with the highest flow rate.

² 350 psi (24 bar) maximum with PVDF liquid end; 250 psi (17 bar) maximum with Polypropylene liquid end.

³ Consult factory for correct component selection for temperatures from 160°F (71°C) to 250°F (121°C).

⁴ D10 @790 rpm maximum.

⁵ D35 @700 rpm maximum.

⁶ D66 maximum inlet pressure 50 psi (3.4 bar) for non-metallic models.

For complete specifications and ordering information, consult the Hydra-Cell catalog.

Hydra-Cell T and Q Series Pumps

**Available
to Meet
API 674!**

T and Q Series Design Features

- Seal-less design separates the power end from the process fluid end, eliminating leaks, hazards and the expense associated with seals and packing.
- Low NPSH requirements allow for operation with a vacuum condition on the suction - positive inlet pressure is not necessary.
- Can operate with a closed or blocked suction line and run dry indefinitely without damage, eliminating downtime and repair costs.
- Unique diaphragm design handles more abrasives with less wear than gear, screw, or plunger pumps.
- Hydraulically balanced diaphragms handle high pressures with low stress.
- Provides low-pulse, linear flow due to its multiple-diaphragm design.
- Lower energy costs than centrifugal pumps and other pump technologies.
- Rugged construction for long life with minimal maintenance.
- Compact design and double-end shaft (T100 and Q155) provide a variety of installation options.

Hydra-Cell
Seal-less Pumps



Hydra-Cell model T100 was a finalist in the Pumps & Systems "Product Innovation" awards, and the T100 Series earned a "Spotlight on New Technology" award from the Offshore Technology Conference.



T100 High Pressure Model.



Q155 Low Pressure Model.



T200 Medium Pressure Model.

NEW

Model	Maximum Capacity			Max. Discharge Pressure psi (bar)	Model	Maximum Capacity			Max. Discharge Pressure psi (bar)	Model	Maximum Capacity			Max. Discharge Pressure psi (bar)
	BPD	gpm	l/min			BPD	gpm	l/min			BPD	gpm	l/min	
T100E	3292	96.0	366.1	1500 (103)	Q155E	5383	157	595	1500 (103)	T200K	3258	95	359	3000 (207)
T100F	2623	76.5	289.6	1850 (128)	Q155F	4354	127	490	1850 (128)	T200M	2915	85	321	3500 (241)
T100H	2332	68.0	257.8	2100 (145)	Q155H	3806	111	421	2100 (145)	T200P	2538	74	280	4000 (276)
T100K	1543	45.0	170.4	3000 (207)	Q155K	2674	78	295	3000 (207)	T200Q	2230	65	246	4500 (310)
T100M	1302	38.0	143.8	3500 (241)	Q155M	2228	65	246	3500 (241)					
T100S	891	26.0	98.4	5000 (345)										

Maximum Inlet Pressure for all models: 500 psi (34 bar).

Maximum Operating Temperature for all models: 180°F (82°C). Consult factory for correct component specification for temperatures above 180°F (82°C) or below 40°F (4°C)

For complete specifications and ordering information, consult the Hydra-Cell T100, Q155, & T200 product bulletins.

Hydra-Cell®

Seal-less Pumps

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