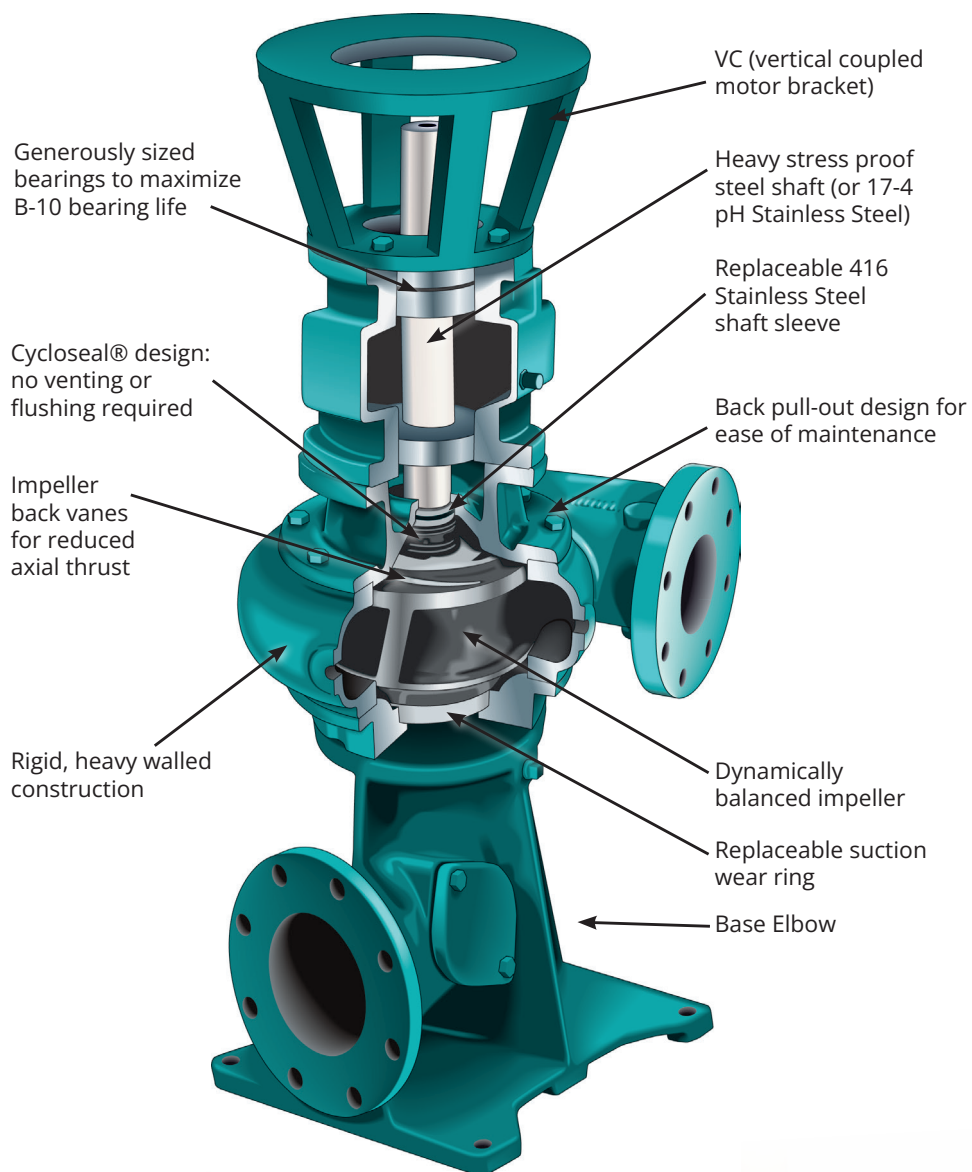


CORNELL PUMP COMPANY

MUNICIPALITIES



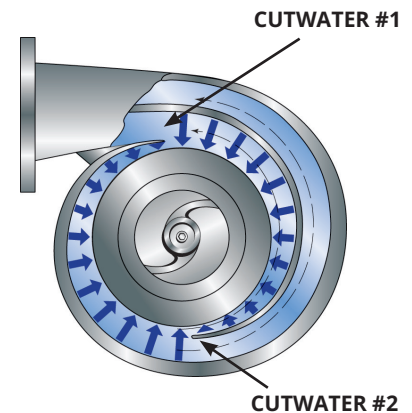
SOLIDS HANDLING



SOLIDS HANDLING

Cornell Solids Handling pumps are used for wastewater, sludge, sewer systems, stringy material, de-watering, abrasive transfer, canneries, construction, dredging, lumber mills, slush ice, reclamation plants, and foundry or mill slag.

With Delta™, Semi-open, Enclosed, and Chopper impellers, Cornell pumps are offered in various discharge sizes ranging from 3 to 30 inches, with heads to 470 feet TDH and flow rates of up to 36,000 GPM.



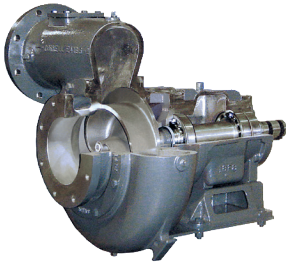
DOUBLE VOLUTE DESIGN

The double volute system enables Cornell single-stage, end-suction centrifugal pumps to perform significant volume and high-pressure jobs efficiently. On single-volute pumps, the increasing pressure acts against the impeller area and creates unbalanced radial forces. By contrast, the double volute system effectively balances these forces around the impeller to reduce shaft flexure and fatigue for longer seal, bearing, and shaft life.

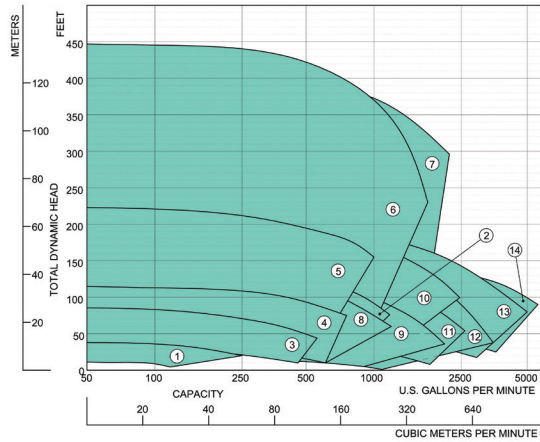
"VARIOUS DISCHARGE SIZES RANGING FROM 3 TO 24 INCHES, WITH HEADS TO 470 FEET TDH, AND FLOW RATES OF UP TO 36,000 GPM."

SOLIDS HANDLING

DELTA™ STYLE PUMPS

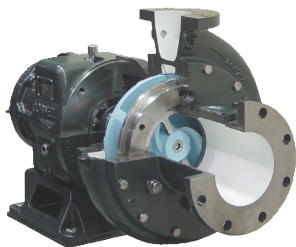


- | | |
|----------|------------|
| 1. 3NLA | 7. 6NHM |
| 2. 4NLDL | 8. 6NNDH |
| 3. 4NNDH | 9. 8NNDH |
| 4. 4NHDH | 10. 10NNDH |
| 5. 4NHM | |
| 6. 6NHDH | |

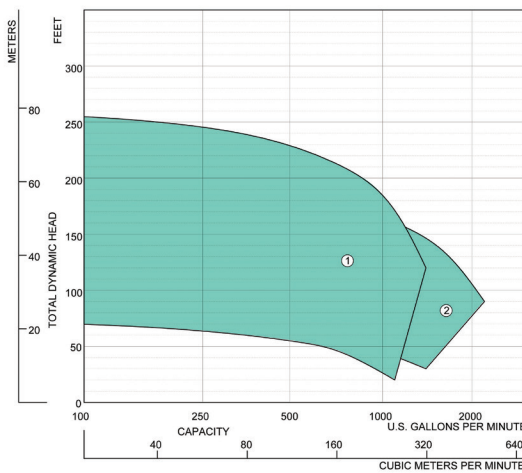


The trailing edges of Cornell's Delta™ impeller vanes extend continuously across the pump's suction entrance to reduce low-pressure areas. Two distinct vortices are created, which pass solids through the impeller. The absence of sharp impeller edges prevents the hang-up of stringy materials. Our enclosed impeller-type pumps can be retrofitted with Delta™ style impellers. Delta™ pumps are available in 3 x 3", 4 x 4", 6 x 6", 8 x 8" and 10 x 10" sizes. Capacities range from 50 to 5,000 GPM, and heads range from 10 to 450 feet.

CHOPPER PUMPS



- | | |
|--------|--------|
| 1. 4NC | 2. 6NC |
|--------|--------|

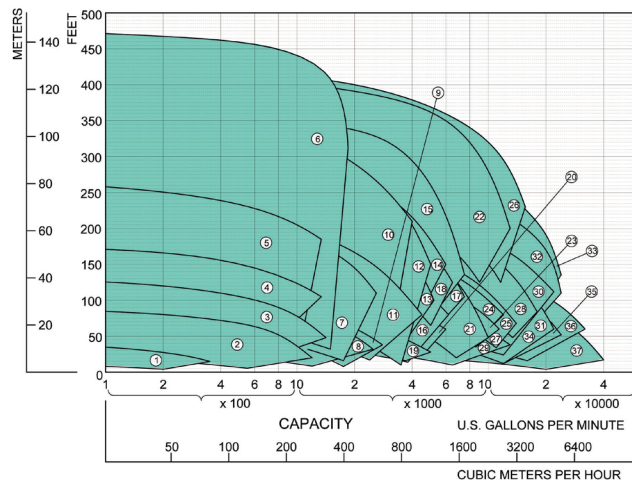


Cornell Chopper pumps, constructed of ductile iron with replaceable cutter bars of heat-treated T1 tool steel, are ideally suited for chopping solids. Back-to-back angular contact ball thrust bearings and single-ball radial bearings make for smooth operation. TDH ranges from 5-250 feet with flows to 2,400 GPM.

IMMERSIBLE PUMPS



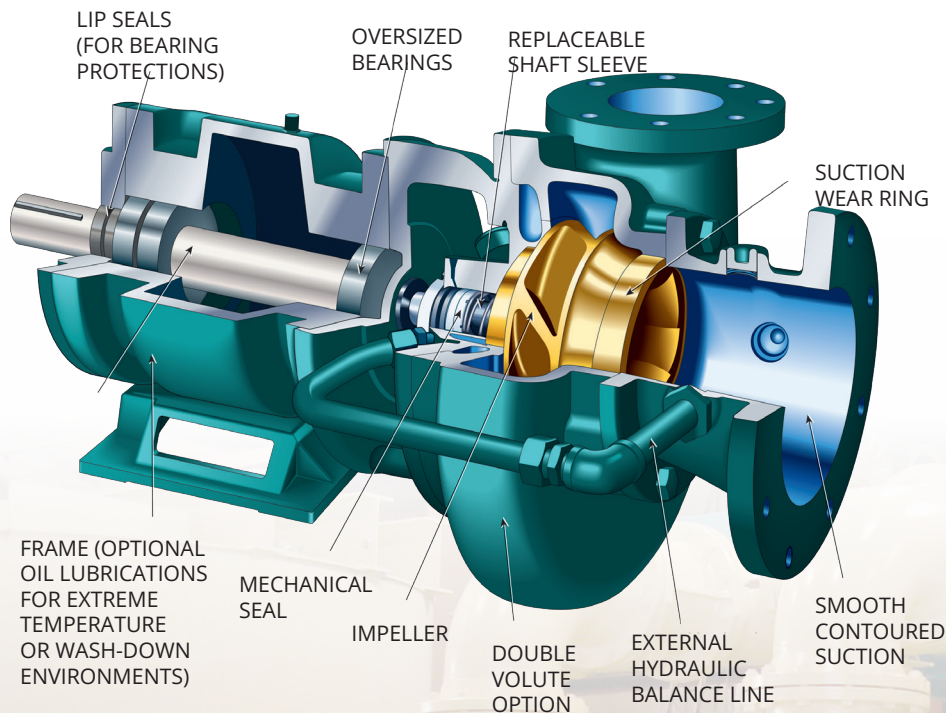
- | | |
|------------|-------------|
| 1. 3NLT | 14. 8NHTR |
| 2. 4NNTL | 15. 8NHGA |
| 3. 4NNT | 16. 10NHTB |
| 4. 4NHTA | 17. 10NHTBH |
| 5. 4414T | 18. 10NHTA |
| 6. 4NHTB | 19. 12NHTL |
| 7. 6NHTA | 20. 12NHTM |
| 8. 6NNT | 21. 12NNF |
| 9. 6NHT/TH | 22. 12NHG28 |
| 10. 6NHTB | 23. 14NHG |
| 11. 8NNT | 24. 14NHGA |
| 12. 8NHTA | 25. 14NHGH |
| 13. 8NHTH | 26. 14NHG28 |



- | | | |
|-------------|-------------|-----------|
| 27. 16NHGH | 31. 18NHFL | 35. 20NHF |
| 28. 16NHG22 | 32. 18NHF34 | 36. 24NNG |
| 29. 16NHG32 | 33. 18NHG34 | |
| 30. 18NHG | 34. 20NHFL | |

The basic design of the immersible pump/motor is a premium, efficient, inverter-duty, P-Base or C-Face, totally enclosed, blower-cooled motor. The design prevents water infiltration along the shaft into the motor using a triple redundant sealing system, including a patented Hydroseal design. The immersible motor can withstand up to 30 feet of submergence depth for two weeks.

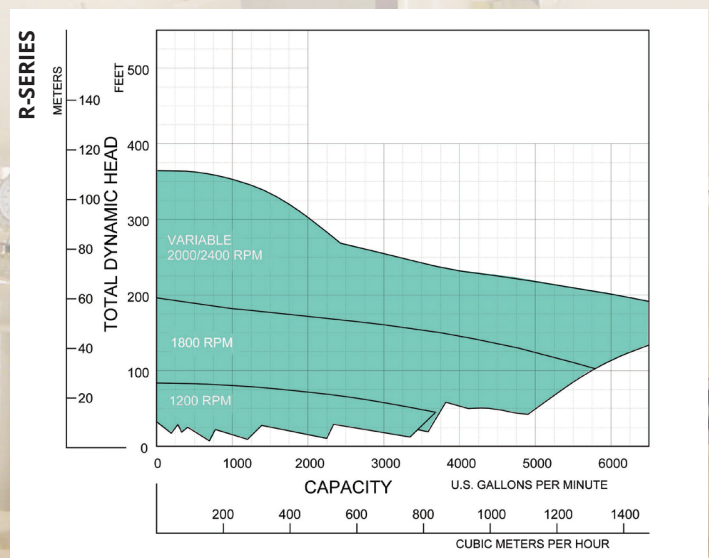
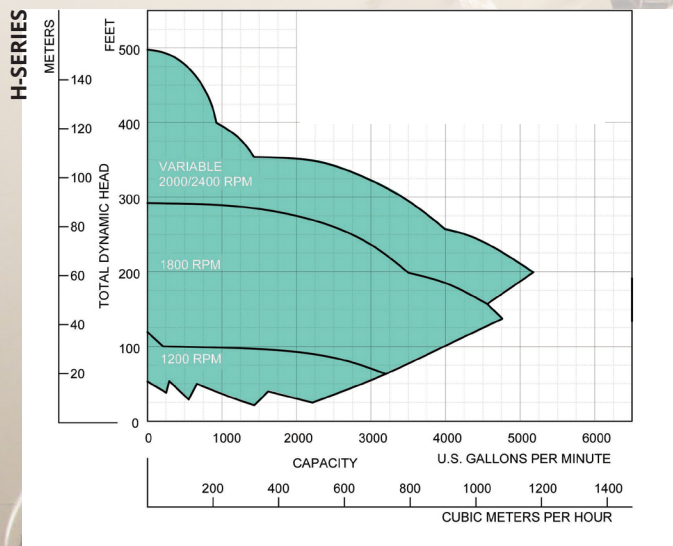
WATER BOOSTER



CLEAR LIQUID PUMPS

Cornell Clear Liquid pumps are used for commercial and residential irrigation, golf course and lawn maintenance, aquaculture, fountains, breweries, laundries, cooling towers, fire fighting, reverse osmosis feed, and potable water booster systems.

The W, Y, R, and H series pumps are available in various materials with discharge sizes ranging from 1 to 10 inches, heads to 450 feet TDH, and flow rates up to 7,000 GPM.



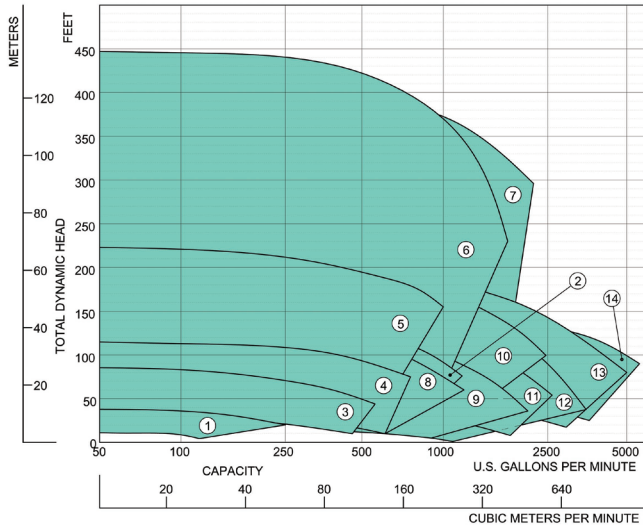
MATERIALS OF CONSTRUCTION

All Cornell clear liquid pumps are constructed with top-quality materials. Cornell water pumps are cast iron, bronze fitted, or all iron construction. Available in NSF-61 / ANSI 372-compliant materials for potable water use. Optional materials are available for abrasive or caustic applications. Standard features include balanced impellers, heavy-duty shafts, replaceable shaft sleeves, and wear rings.



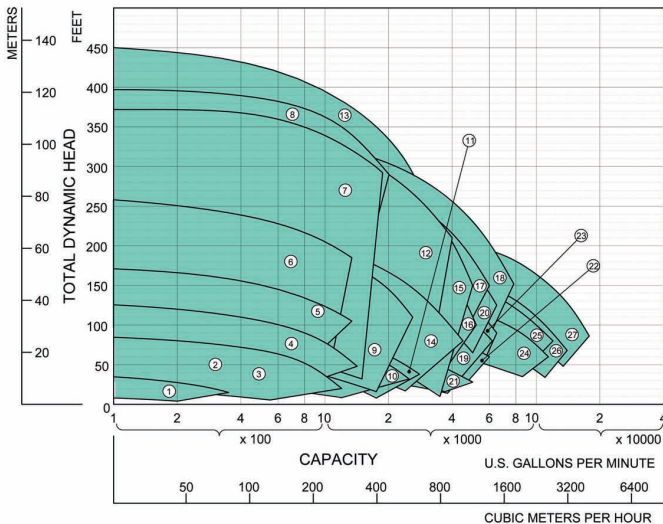
SUBMERSIBLES

DELTA™ SERIES PUMPS



MODEL	5. 4NHDH	10. 6NHM
1. 3NLA	6. 4NHM	11. 6NNDH
2. 3NLHM	7. 4NHM17	12. 8NNDH
3. 4NLDL	8. 4NLHM	13. 10NNDH
4. 4NNDH	9. 6NHDH	14. 10NHM

ENCLOSED IMPELLER PUMPS



MODEL	7. 4NHTB	14. 8NNT	21. 12NHTL
1. 3NLT	8. 4514T	15. 8NHTA	22. 12NHTM
2. 3NNTL	9. 6NHTA	16. 8NHHT	23. 12NNT
3. 4NNTL	10. 6NNT	17. 8NHTR	24. 14NHG
4. 4NNT	11. 6NHT/TH	18. 10NNT	25. 14NHGA
5. 4NHTA	12. 6NHTB	19. 10NHTB	26. 16NHGH
6. 4414T	13. 6NHTB19	20. 10NHTA	27. 16NHG22

CORNELL SUBMERSIBLES

Cornell uses the same high-efficiency pump-ends for our submersibles that have been proven time and again in standard municipal applications. Cornell's submersible product line provides the best possible value by using the highest quality motors.

SUB ACCESSORIES

HEAVY DUTY AUTO-COUPLING ASSEMBLY - Discharge elbow with lift-out sealing flange assemblies to allow pump service without disconnecting the plumbing. Available for submersible pumps over the weight limit of STANDARD DUTY auto-couplings or for larger installations requiring a HEAVY DUTY base.

- Ductile iron construction
- Guide rail supports designed to accept standard pipe rails
- O-ring and rubber face sealing ring
- Non-Sparking Design available for specific sizes (contact factory)

Cornell offers different impeller designs for liquid wastewater applications. Cornell's delta-style impellers shown on the right below is excellent for handling debris, rags, and extremely heavy sludge where there are low to medium head requirements. The two- and three-port enclosed impellers on the bottom left are designed to handle large solids and maintain excellent efficiencies.



Enclosed Impeller for high efficiency, 3" solids diameter or larger



Delta™ Style Impeller for Rags, Stringy Material and other severe applications

"CAPACITIES FROM 80 GPM TO 15,000 GPM AND HEADS FROM 10 FEET TO 400 FEET GIVE CORNELL A CLEAR PERFORMANCE ADVANTAGE."

HYDRO-TURBINE

PUMP STATION BYPASS

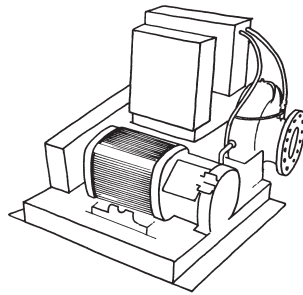
Cornell Redi-prime® pumps are designed with a suction larger than the discharge. This provides more flow due to reduced friction losses. Cornell's priming system was explicitly designed with the environment in mind. Using a positive sealing float box and a diaphragm vacuum pump means no water carries over to contaminate the environment. Suction lifts of 28 feet and heads of up to 470 feet are possible depending on suction losses and operating points on the pump curve.

The Redi-prime® system includes a vacuum-assisted diaphragm pump, Cycloseal®, and Run-Dry™ features. It is a compact, fully automatic, self-priming system and delivers high hydraulic efficiencies.

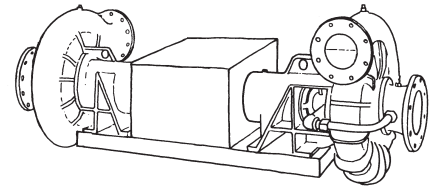
Industrial plants, municipalities, HVAC installations, and farms are tapping potential hydraulic energy sources to produce electric power as a revenue source or to reduce overall energy demands. Cornell turbines can handle heads up to 600 feet and flow up to 18 cubic feet per second.

STANDARD TURBINE CONSTRUCTION:

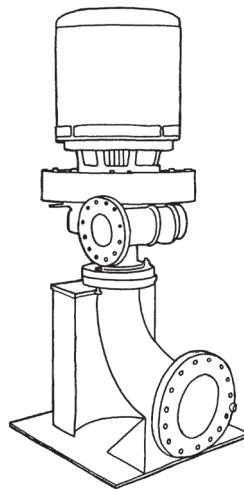
- Cast Iron, Bronze fittings - optional, Ductile Iron, Steel, Bronze, Stainless Steel.
- Mechanical shaft seal is standard, packing is optional.
- Standard ODP generator- optional TEFC.
- Hydro blue, double applied paint.



Synchronous generator for stand-alone applications with hydraulic-electric load controller, belt (or direct) drive to turbine, all base assembled.

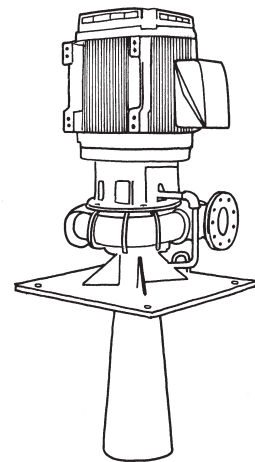


Horizontal frame mounted turbine, direct drive to an energy requiring device. (Turbine driving a pump is shown. A generator may be substituted for the pump.)

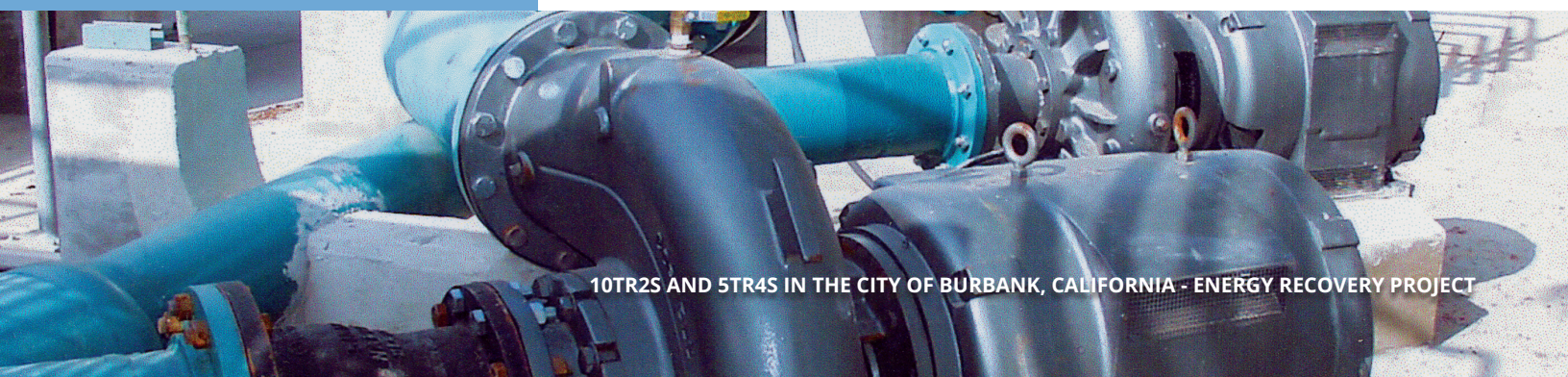


Vertical mount, close coupled turbine with optional integral flywheel* and base elbow. (Also available without flywheel)

*Flywheels are used to prevent excessive surge pressures and to give more stable speed control



For added space saving or simplicity of manifolding, close coupled, vertical mount with custom draft tub (available less draft tub for discharge manifold mounting).



10TR25 AND 5TR4S IN THE CITY OF BURBANK, CALIFORNIA - ENERGY RECOVERY PROJECT

CUTTER SOLUTIONS



BLADE CUTTER

Consists of a rotating and stationary cutter utilizing a standard impeller.

- Minimal energy consumption (4% or less) for solution
- Designed to break up clogs/ragging
- Hardened cutter material
- Adjustable clearances
- Minimal flow restrictions
- Does not change external pump dimensions
- Retrofittable



WASTE WARRIOR

AUGER CUTTER

The more aggressive solution features scythe-like edges from the impeller eye, sweeping all the areas where the suction pipe meets the volute.

- Handles most aggressive and troublesome clogs and ragging
- Limited energy consumption (around 8%) for solution
- Hardened cutter material
- Insignificant flow restrictions
- Does not change external pump dimensions
- Retrofittable

HOW ARE CUTTERS AND CHOPPERS DIFFERENT?

Cornell also makes a chopper pump series in addition to the cutter pumps. While choppers can dice up even more aggressive clogs than cutters, they sacrifice flow, efficiency, and head to operate.

USE A CUTTER FOR:

- ✓ Clogs and ragging
- ✓ To save energy costs
- ✓ When you need a wide range of heads and flows
- ✓ If you want to retrofit
- ✓ If you are passing along to a main trunk or pipeline

USE A CHOPPER FOR:

- ✓ Severe plugging
- ✓ When energy efficiency is a minimal concern
- ✓ If the application will work with a narrow flow range
- ✓ If you don't need to work with existing equipment
- ✓ If you are unconcerned that material will plug further in process

WATCH A VIDEO

Use your smartphone QR reader to see a short video about the auger cutter solution for the SW Washington water district, or visit our website at <http://www.cornellpump.com/support/videos.html>





NSF-CERTIFIED PUMPS

Cornell Pump boasts nearly two dozen clear liquid pump models certified to meet the NSF/ANSI 61 and 372 Certifications for lead content. These pumps can be specified in projects which require pumps to meet these strict certification levels.

Features include:

- Discharge size from 1.25" to 8" (3cm to 20cm),
- Flows from 30 GPM to near 6,000 GPM (7 to 1,360 m3/h)
- PSI 15.5 to 216
- Heads from 40' to over 500' (12.2 to 152m)
- NPSHr as low as 4' (1.22 m)
- High-efficiency design to save energy costs
- Cycloseal® Sealing system
- Two-year warranty

USES FOR NSF PUMPS



Municipal: potable water applications to transfer water from rivers, wells, and reservoirs to treatment facilities, intra-facility, and end-users. Helpful in retrofits to abate lead and other contaminant issues, the pumps are also applicable in agricultural irrigation where lead content is regulated.

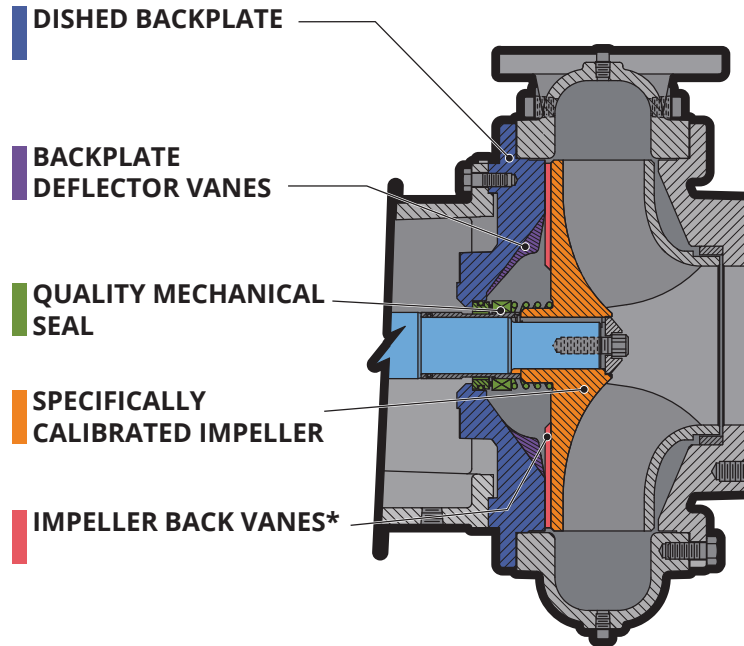


Industrial: potable water applications in industrial plants to transfer water into factories, where no lead content can be added. Also, for pump-treated or pre-treatment waste streams out of factories, to avoid introducing lead into the watershed or municipal treatment facilities. Additionally, they can be used in food packing applications where liquid with the product is required to meet lead-free standards.



Rental: The pumps are helpful in rental applications where certification alleviates the concern over the pump's potential for contributing to lead contamination.

DISCHARGE SIZE	NSF 61 CERTIFIED MODELS
1.25-1.5"	1.25W, 1.25YH, 1.5WH, 1.5YH
2" to 2.5"	2WHA, 2YH, 2.5WH, 2.5YH
3"	3RB, 3WHA, 3YH
4"	4HH, 4RB, 4WH
5"	5HH, 5RB, 5YB, 5YBH
6" or greater	6H, 6HH, 6RB, 8H



CYCLOSEAL® — THE SEALING SYSTEM INTEGRAL TO CORNELL PUMPS

Cornell's manure pumps come equipped with the patented Cycloseal sealing system, which leverages cyclonic action to extract solids and abrasive substances from the seal area while simultaneously purging air and gas pockets. This groundbreaking technology extends the lifespan of the seal and eliminates the requirement for venting or flushing water.

No Flush Water or Packing: Cycloseal technology eradicates the need for packing or flushing water with its backplate and wide vanes, leading to cost savings, less service time, and no messy drips.

Extended Seal Life: Cornell's Cycloseal is highly durable in harsh conditions such as manure slurry, starch recovery, clear water, food processing, and self-priming applications, with the potential to triple the expected seal lifespan.

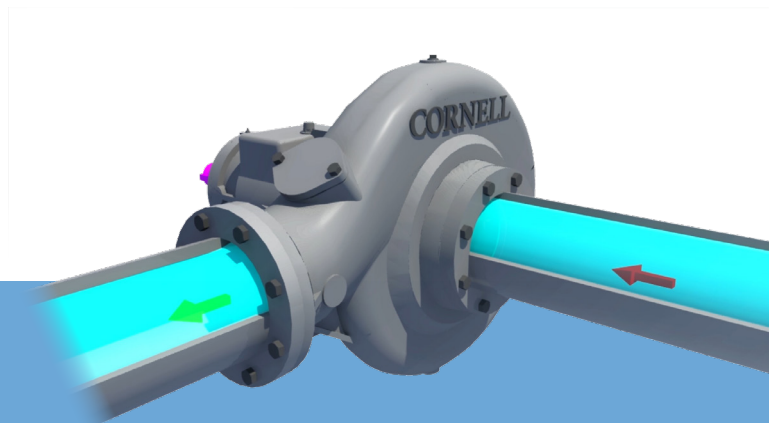
Run-Dry™ Option: Cornell's Cycloseal system-equipped pumps have an optional Run-Dry feature that lubricates the seal faces even without liquid in the pump casing. The Run-Dry feature is indispensable in scenarios where the pump must operate dry for an extended duration or may lose prime unexpectedly without being turned off.

System Savings: Cycloseal system eliminates the need for external water flush, filters, grease cups, or piping typically found in pumps with packing or mechanical seals.

Better for Abrasive Applications: Cycloseal is more durable than packing and regular mechanical seals that come into contact with grit and other substances, as it prevents solids from entering the seal area, resulting in less seal wear.

Greater Reliability: With positive seating, end users can easily detect when the Cycloseal is correctly installed, leading to longer service intervals due to its increased ability to withstand grit.

Maintenance Savings: A more durable seal results in less pump downtime and lower maintenance expenses throughout the pump's lifespan.



**Watch the Cycloseal video
online to see it in action:**

<http://www.cornellpump.com/cycloseal-system/>

CYCLOSEAL® SAVES YOU FROM FLUSHING AWAY MONEY!

Each pump requiring flush water can incur costs of \$10,000 or more. For instance, a typical 6" pump uses 3 gallons per minute, which may not seem like much. Still, it adds up to over 1.57 million gallons (5,950 m3) annually. Larger pumps, such as 8" and 16" to 24" pumps, consume even more water, with some using 8 million gallons (30,300 m3) or more per year. When you factor in multiple pumps per location and several locations per organization, the amount of water utilized just for seals is HUGE.

Cycloseal® provides an answer:

- REQUIRES NO FLUSH WATER.
- Uses inexpensive and easy-to-change type 1 or 2 mechanical seals.
- Saves \$10,000 or more in flush costs.
- More environmentally friendly alternative.
- Plus, Cornell Pumps are high-efficiency and can save your operation even more money.

COST OF A GALLON OF WATER	GALLONS PER MIN	GALLONS PER DAY	GALLONS PER YEAR	EXPENSE
\$0.02	1	1,440	525,600	\$10,512
\$0.02	3	4,320	1,576,800	\$31,536
\$0.02	5	7,200	2,628,000	\$52,560
\$0.02	8	11,520	4,204,800	\$84,096

The table illustrates the costs involved, with prices per gallon typically paid by a wastewater treatment plant for their water. In some locations, costs can be as high as \$0.22 per gallon, resulting in nearly \$35,000 in flush water for the same 6" pump.

CORNELL PULSE™



- CONNECTS VIA SHORT-RANGE WIRELESS
- PROVIDES A SNAPSHOT OF OPERATION
- INCLUDED ON ALL NEW CORNELL PUMPS*
- RETROFITTABLE TO OLDER PUMPS OR OTHER EQUIPMENT

LEADING-EDGE REAL TIME SNAPSHOT

Cornell Pulse is a new method to measure pump temperature and vibration in real time. The device is a small wireless unit, less than 2" in circumference, which is mounted on the pump and takes readings when prompted by the user via a mobile app. The app can be used on phones and tablets and allows detection of common pump issues if the user keeps track of the

readings. Pulse is designed to withstand tough wash-down conditions and can last up to five years with daily measurements (more frequent measurements use battery power and reduce service life.)



DOWNLOAD THE PULSE APP



Connect via Cell Network



5 Sensor Inputs



Remote Control



CORNELL Co-Pilot™

THE POWER OF IOT

Cornell Co-Pilot is a monitoring system that connects to your pump to track temperature, vibration, and location. Co-Pilot can also be powered with a wired connection for continuous monitoring and control system integration. Our Internet of Things (IoT) platform reflects our dedication to cutting-edge design and meeting customer needs.

USE THE CO-PILOT TO:

- Plan maintenance
- Check operation
- Reduce manual inspections
- Track pump location
- Demonstrate run conditions to customers on warranty claims
- Improve run time through the maintenance program

MONITORING AT YOUR FINGER TIPS

Easily monitor your pump's performance with desktop and mobile apps available for iOS and Android. Receive alerts for out-of-condition operations and view the last GPS location of the pump, all in one convenient platform.

CORNELL CO-PILOT ALLOWS YOU TO:

- Monitor pumps using the cloud and IOT
- Monitor temperature, vibration, and GPS location
- Additionally monitor pressure, flow, start/stop operations, and more*
- Track data over time via web-based and mobile apps
- Receive real-time pump data for performance and health monitoring
- Receive alerts for preset running conditions

*Requires external sensors; contact Cornell for details.

PART OF RPM² ASSET
MANAGEMENT SYSTEM



CORNELL PUMP COMPANY MARKET & PRODUCT LINE



AGRICULTURE



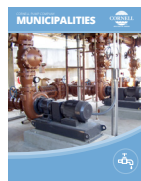
FOOD PROCESS



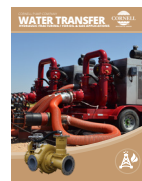
INDUSTRIAL



MINING



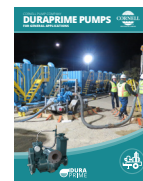
MUNICIPAL



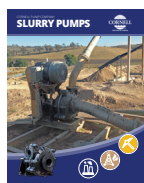
WATER
TRANSFER



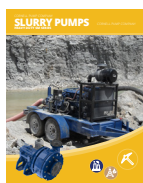
REFRIGERATION



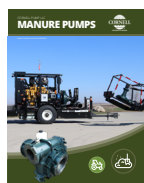
CONSTRUCTION



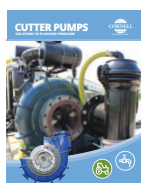
SLURRY



SLURRY SM



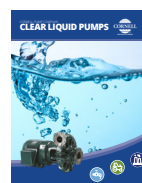
MANURE



CUTTERS



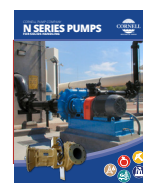
SELF PRIMING



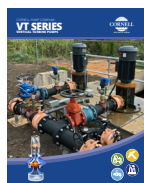
CLEAR LIQUIDS



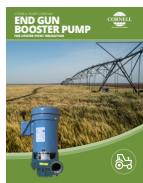
MX SERIES



N SERIES



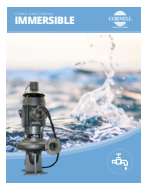
CYCLONE™



EDGE™



HYDRAULIC
SUBS



IMMERSIBLE



CD4MCU



RUN-DRY™



PRIMING
SYSTEMS



CYCLOSEAL®

CycloSeal® and Redi-Prime® are Registered Trademarks of Cornell Pump Company.

Cornell pumps and products are the subject of one or more of the following U.S. and foreign patents:

6,074,554; 6,036,434; 6,079,958; 6,309,169; 6,104,949.

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