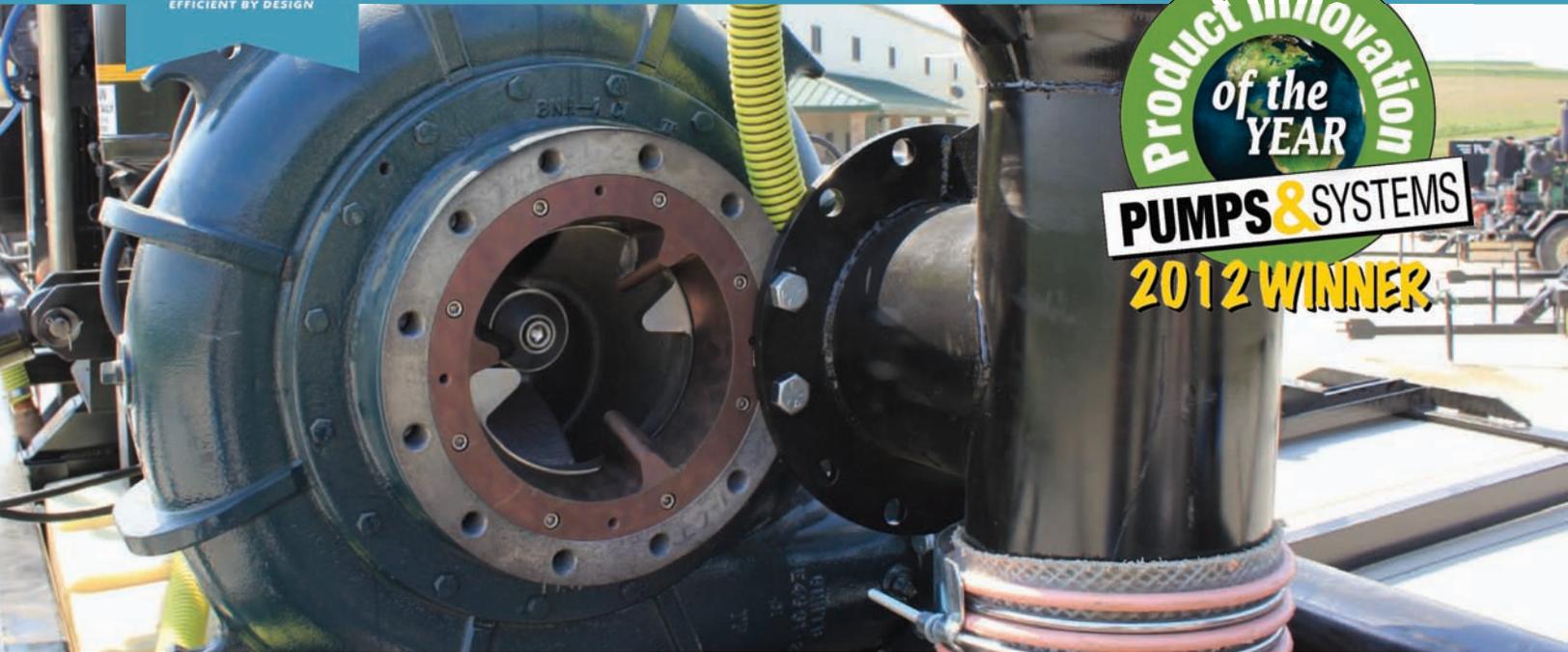




CORNELL PUMP COMPANY

# CUTTER PUMPS



EFFICIENT BY DESIGN



# CUTTER PUMPS



## ADDRESSING AN URGENT NEED

Ragging and fouling of impellers has plagued wastewater applications for years. With the increased use of 'flushable' materials and extraneous cleaning products, the issue of clogging, downtime, and pump damage have increased dramatically.

**A CUTTER SOLUTION.** Cornell created an innovative cutter design, using a stationary and rotating element to reduce masses of solids to a size that will pass through the pump. Most cutter models have efficiencies that are reduced less than 4% from standard Cornell efficiencies for enclosed, solids handling impellers. This minor reduction is offset by a dramatic increase in "up times". The resulting increase in pump station efficiency can save tens of thousands of dollars per year.

- Minimal Energy Consumption
- Designed to break up clogs/ Prevent Ragging
- Hardened cutter material
- Adjustable

## RETROFIT AND NEW PUMPS

The cutter rings can be installed in the majority of Cornell solids handling pumps, and in most cases a motor change is not required. New Cornell pumps from 3" to 16" can be furnished with cutters. Cutter additions to new and existing Cornell Pumps do not result in external dimensional changes to the pump, avoiding costly piping changes in the station.

## NEW PRODUCT ADDITION OR RETROFIT DOES NOT CHANGE EXTERNAL PUMP DIMENSIONS.

## FEATURES

- Cutters are hardened for long life
- Cutters are shaped to minimize flow restrictions
- Cutters in new pumps are covered by our Industry leading, Two Year Warranty

## BENEFITS

- Minimal increase to cost of operation
- Labor savings by reducing clean out events
- Pump Station efficiency improvement by reducing down time and periods of low flow





# CUTTER PUMPS

Another Cutter installation on a manure boat can be seen by scanning this QR code with a smartphone.



## TESTIMONIAL—CUTTER IN ACTION SAVES THOUSANDS OF DOLLARS

Since Introduction in July 2011, Cornell has numerous customers excited about how the cutter pumps have changed their maintenance schedules and increased their ability to do standard/regular repairs rather than emergency pulls for ragging, thus saving them tens of thousands of dollars.

Following is a testimonial from a Southern California water district and their experience with Cornell's Cutter pumps.

"The water district replaced another manufacturer's pump with a Cornell 8NHTA cutter pump in February 2012. After the installation of this new pump, the Maintenance Superintendent went to the station to give it a real test by cleaning the wet well. He indicated that this wet well was very dirty, with a large blanket of rags and trash in which he intends to run through this pump for this test, and to confirm that the pump can be used to clean the wet well on a routine basis. He had the Collections Crew stand by with wash water to wash down the wet well as he pumped this debris through the pump. According to his staff, there were even items such as large plastic sports drink bottles that were running through the pump. According to the superintendent, the pump never choked, or made any indication of exertion. After the wet well was fully cleaned, his staff opened a volute inspection port to inspect the pump. It was clean and had no debris whatsoever in the impeller or volute.

Needless to say, he was very happy with this progress. So happy they are considering installing new or modifying existing pumps to have at least one cutter pump per station."  
~Cornell SoCal Distributor

**CORNELL PUMP COMPANY APPLICATIONS**

**1 AGRICULTURE**

**REMOTE CONTROLLED AGITATORS**

Cornell Pump helps AgriNet the Liquid Fertilizer Industry with New Cutter Pump Dispensing Applications

On Numerous animal farms in the Midwest

**The Problem:** A leading Nebraska company specializing in liquid manure wants to increase fertilizer efficiency while saving on personnel and fuel expenses that could be put to other uses. The manure needs to be agitated to ensure that the liquid fertilizer has an even mix of nutrients and is ready to be used.

Traditionally, agitation has been accomplished through use of a large motor (usually 1000 HP) and a mechanical agitator. This has often proved to be a major maintenance headache. The agitator is often damaged by debris, and the motor is often replaced. In addition, the agitator is often replaced by a motor that is not designed for the application. The agitator is often replaced by a motor that is not designed for the application. The agitator is often replaced by a motor that is not designed for the application.

**The Solution:** Cornell designed three different liquid agitation blades. The entire system can be agitated continuously using a 100 HP motor. The motor is mounted on the side of the tank. The agitator is mounted on the side of the tank. The agitator is mounted on the side of the tank. The agitator is mounted on the side of the tank.

**Powering this Innovation are Cornell Pumps:** The Cornell 8NHTA pump is featured on their smaller boats, while the 8NHTA pump is featured on their larger boats.

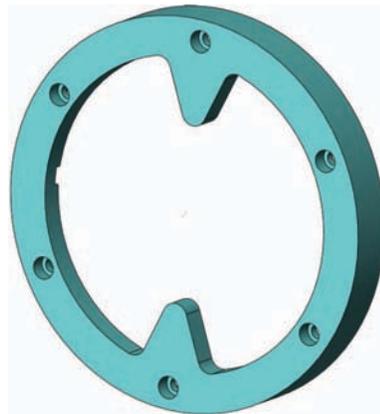
**End Results:** The Cornell liquid agriNet system is preferred over the agitator because it is more efficient, more reliable, and more cost-effective. The Cornell liquid agriNet system is preferred over the agitator because it is more efficient, more reliable, and more cost-effective. The Cornell liquid agriNet system is preferred over the agitator because it is more efficient, more reliable, and more cost-effective.

**Additional Applications:** The Cornell liquid agriNet system is preferred over the agitator because it is more efficient, more reliable, and more cost-effective. The Cornell liquid agriNet system is preferred over the agitator because it is more efficient, more reliable, and more cost-effective.

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## CHARACTERISTICS & OPTIONS WITH MOST CORNELL CUTTER PUMPS

- Replaceable case wear rings
- Double volute (many models)
- Heavy-walled castings
- Replaceable shaft sleeves
- Various mounting configurations
- High efficiency
- High Suction Lift (Redi-Prime® versions)
- Two-year warranty
- Oversized bearings
- Minimum 20,000 hours bearing life
- Patented Cycloseal® design
- Low cost of repair
- Lower operating cost



ROTATING CUTTER



STATIONARY CUTTER

## THICKER, SLEEVED SHAFTS

Cornell's alloy steel shaft is more than 25 percent larger in diameter than most other competitors. Cornell's shafts withstand higher loads without excessive deflection, prolonging both shaft and seal life. Cornell builds pumps with shaft sleeves standard—providing a wear surface that is more easily replaceable for less cost than a shaft. If sleeves are available from a competitor, they are often an expensive option. Cornell has 420HT sleeve shafts available for abrasive environments.

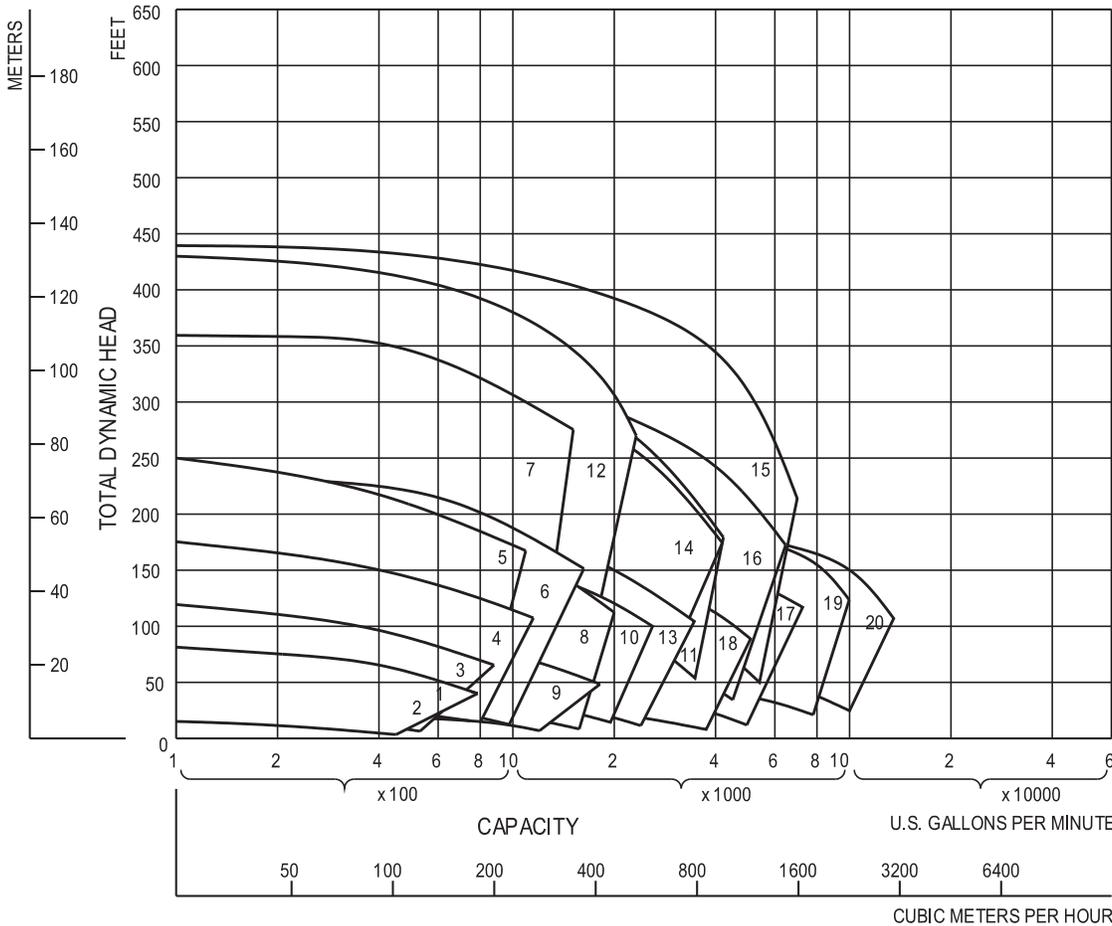
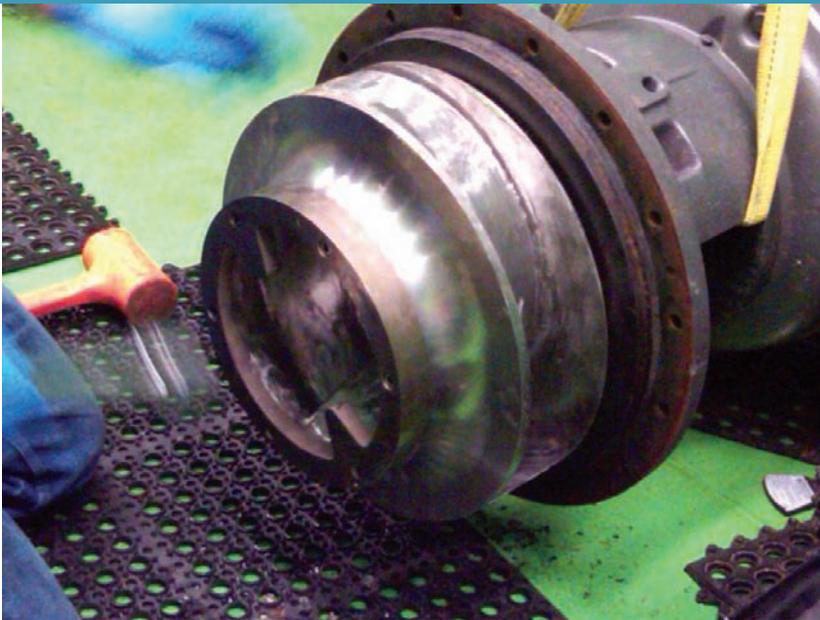
Economical solution to repeated clean out expenses

Most installations save thousands of dollars a year in staff time. Below are some examples of cost savings users have seen with Cornell cutter pumps.

- Average time per event: 6 hours (two workers for three hours)
- Cost per man hour: \$50
- Total direct cost per event: \$300
- Events per week: 2
- Total annual direct expense \$31,200
- Total lost man hours that could be used maintaining other items: 624 annually



# CUTTER PUMPS



MODEL

1.	3NNTL	1500-1800
2.	4NNTL	1200-1800
3.	4NNT	1200-1800
4.	4NHTA	1200-1800
5.	4414T	1200-1800
6.	4514T	1200-1800
7.	4NHTB	1200-1800
8.	6NHHTA	1200-1800
9.	6NNT	1200-1800
10.	6NHHTH	1200-1500
11.	6NHTB	1200-1800
12.	6NHTB19	1200-1800
13.	8NNT	1200-1800
14.	8NHHTA	1200-1800
15.	8NHHTH	1200-1800
16.	10NNT	1200-1800
17.	12NNT	1200-1800
18.	12NNT	1200-1800
19.	14NHG	1200-1500
20.	16NHG22	900-1200

NEW PAGE

FAM-SOLID-CUT-VAR



Cornell Pump Company • Portland, Oregon

FAMILY MAP - NON-CLOG PUMPS  
ENCLOSED IMPELLER

10/10/11

\*OTHER PUMP MODELS AVAILABLE

# CUTTER PUMPS



## IMPROVES PUMP STATION UP TIME AND EFFICIENCY

On average, installations have dropped from an average of clogging three times a week, to less than once a month.

## MAY REDUCE FORCE MAIN CLOGS

Many installations have dramatically reduced clogging downstream. This allows more maintenance time to address standard and routine issues rather than emergency repairs.

- MINIMAL ENERGY CONSUMPTION
- DESIGNED TO BREAK UP CLOGS/ PREVENT RAGGING
- HARDENED CUTTER MATERIAL
- ADJUSTABLE



## ADDITIONAL PUMPS AND PRODUCTS AVAILABLE

### CLEAR LIQUID PUMPS

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

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



### REDI-PRIME®

Cornell Redi-Prime® pumps are designed with oversized suctions to provide more flow, reduced friction losses, and higher suction lift. The priming system was designed with the environment in mind. By using a positive sealing float box and a diaphragm vacuum pump, there is no water carry-over to contaminate the environment. With suction lifts of up to 28 feet, heads to 470 feet and flow rates exceeding 20,000 GPM, most Cornell pumps can be readily fitted with the Redi-Prime® system.



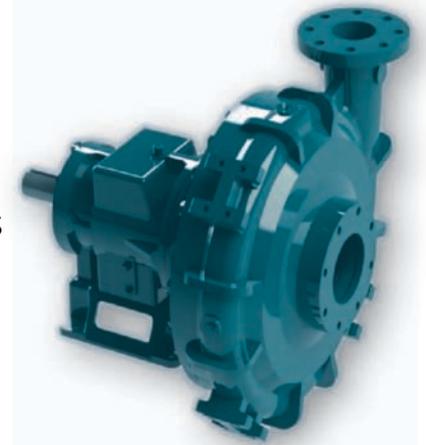
## HYDRAULIC SUBMERSIBLE PUMPS

Cornell's DuraSub™ uses a heavy duty pump end and bearing frame for direct coupling to a hydraulic motor. The DuraSub™ has a modular design which allows standard Cornell pump ends to be used as a Hydraulic submersible pump.

- Available for most Cornell pump models
- Hydraulic motor driven
- Various adapter plates available for hydraulic motor fit
- Heavy duty shaft / bearing frame assembly and wet end construction
- Premium wet end efficiencies reduce horsepower requirements
- Heavy duty pumps ends for long service life and reliability

## MX SERIES HIGH PRESSURE PUMPS

**Pressures to 800 feet TDH and flows to 4000 GPM.** Designed to handle high head applications while providing a long service life. The new high head MX SERIES pumps have multi-vane, enclosed impellers designed for INDUSTRY LEADING EFFICIENCY. The MX SERIES pumps have extra heavy wall thickness, high quality construction, CA6NM impellers and are available in a horizontal frame & SAE mounted configurations.



## DELTA™ STYLE PUMPS

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 hang-up of stringy materials. Many of 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

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 30-200 feet with flows to 1,500 GPM.

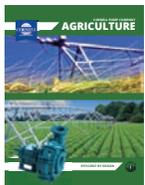


## IMMERSIBLE

The basic design of the immersion 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 by utilizing a triple redundant sealing system, including a patented Hydroseal design. The immersion motor can withstand up to 30 feet of submergence depth for a 2 week period.



# MARKET AND PRODUCT LINE



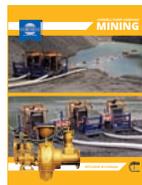
AGRICULTURAL



FOOD PROCESS



INDUSTRIAL



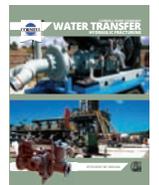
MINE DEWATERING



MUNICIPAL



REFRIGERATION



WATER TRANSFER



CHOPPER



CUTTER



EDGE™



HYDRAULIC SUBS



HYDRO TURBINE



IMMERSIBLE



MANURE



MP SERIES



MX SERIES



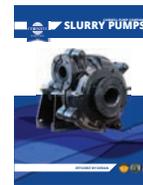
OIL & GAS



REDI-PRIME®



STX SERIES



SLURRY



SUBMERSIBLE

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: 3,207,485; 3,282,226; 3,295,456; 3,301,191; 3,630,637; 3,663,117; 3,743,437; 4,335,886; 4,523,900; 5,489,187; 5,591,001; 6,074,554; 6,036,434; 6,079,958; 6,309,169; 2,320,742; 96/8140; 319,837; 918,534; 1,224,969; 2,232,735; 701,979 and are the subject of pending U.S. and Foreign Patent Applications.



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