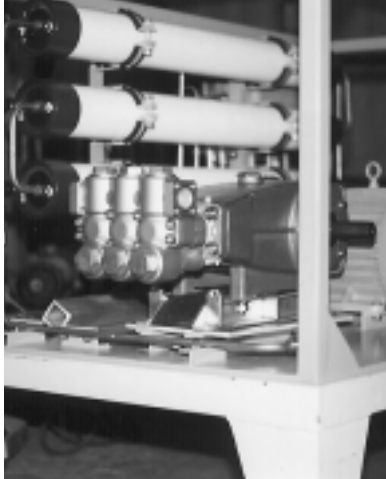


# Application Catalog





**The CAT PUMPS product line has developed into more than a dozen frame sizes of piston and plunger pumps rated from 1-320 GPM, 100-7000 PSI. Our most recent additions include the new K-Series and R-Series pumps.**

**To meet the needs of a wide variety of high pressure applications, special options are available including belt drive pumps, motorized units, direct-drive with bell housing and flexible coupling and liquid-end construction of 316 Stainless Steel, W770, and Duplex Stainless Steel.**

**System accessories and protective devices match specific pump model specifications to assure safe and optimum system performance. Single and multiple pump Power Units are also available offering tested performance and minimal delivery time.**

**To view stories on how CAT PUMPS are performing, how they have reduced operating costs; minimized downtime; improved production and enhance the environment; visit our web site at [www.catpumps.com/Applications](http://www.catpumps.com/Applications) or request an Application Catalog via email to [litorders@catpumps.com](mailto:litorders@catpumps.com).**

**Use the Typical Applications for Positive Displacement Pumps table as a guide for your next application.**

**Share your experience by completing our “Application Story” form at [www.catpumps.com/Applications](http://www.catpumps.com/Applications). Receive a \$100 Gift Certificate towards any future CAT PUMP purchase.**

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# TYPICAL APPLICATIONS FOR POSITIVE DISPLACEMENT PUMPS

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Injection - Oil Field, Water/Glucose						•	•	•	•	•	•	•	•		
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Processing - Chicken/Turkey Deboning						•	•	•	•						



# APPLICATION STORY

# \$100

## *Gift Certificate*

### Win a Gift Certificate Worth One Hundred Dollars

towards the purchase of any CAT PUMPS product or logo merchandise if your application story and photo are selected to be included in our next Application Catalog.

Submit your story and photo to:  
CAT PUMPS, Application Story Contest,  
1681 94th Lane NE, Minneapolis, MN 55449

All entries will be reviewed monthly and you will be notified within 90 days, if your story has been selected.

Enter as many times as you like, but remember, we are looking for stories featuring information such as:

- The oldest operating CAT PUMP in an industrial application
  - Operating costs/savings over previous system
- How product or performance was improved by using a CAT PUMP
  - A truly unique use of pumping liquid under high pressure



Phone: 763 • 780 • 5440 FAX: 763 • 780 • 2958  
www.catpumps.com • e-mail: techsupport@catpumps.com

# APPLICATION STORY FORM

**Application Title:**

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**Problem:**

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**Solution:**

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**Operation:**

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**Specifications:**

CAT PUMP Model \_\_\_\_\_  
PSI \_\_\_\_\_  
GPM \_\_\_\_\_  
Liquid Temperature \_\_\_\_\_  
Liquid \_\_\_\_\_  
Cycle \_\_\_\_\_  
Hour/Day \_\_\_\_\_ Day/Year \_\_\_\_\_  
Drive \_\_\_\_\_

**Benefits:**

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Submitted By: \_\_\_\_\_

Phone \_\_\_\_\_

Company \_\_\_\_\_

FAX \_\_\_\_\_

 Sending Photograph     Sending 300 dpi tiff

e-mail \_\_\_\_\_

***Remember an action photo or a before and after view.***

# Agriculture and Food Processing

- 56 No-Tillage Ag Injection
- 72 Row Crop Spraying
- 127 Potato Cleaning
- 139 Disease Control-Hog Washing
- 141 Crop Spraying



# APPLICATIONS

## PUMPS



Seven spray arms operate simultaneously injecting fertilizer through the "0" nozzles at 2200 PSI.

### OPERATION:

Mike Gatton, District Manager for Na-Churs®, recognized the benefits of high pressure injection over conventional methods of fertilizer application and made the necessary equipment modifications on his own.

He installed a Cat Model 3517 pump which is PTO driven off the tractor to deliver 14 GPM at 2200 PSI to seven injection arms. These arms each have a pivotal foot to adjust to the ground level and hold both the active spray nozzle, as well as, a selection of other nozzles for quick change to accommodate the soil and penetration desired. He can treat eight rows of corn or beans at a time with penetration of 4 to 8 inches.



## NO-TILLAGE HIGH PRESSURE AG INJECTION

### File No. 56 Section 1

#### PROBLEM:

To find an effective, economical no-till fertilizer applicator.

#### SOLUTION:

Install a dependable, corrosion resistant, 3000 PSI high pressure CAT PUMP to inject liquid fertilizer.

#### SPECIFICATIONS:

CAT PUMPS Model .....	3517
Pressure.....	2200-3000 PSI
Flow .....	14 GPM
Temperature .....	Ambient
Fluid.....	Nitrogen/Fertilizer Rinse Water, Cropoil Neutralizer Rinse
Duty Cycle.....	Intermittent
Drive .....	PTO Tractor

#### BENEFITS:

- It provides a "no cultivation" fertilizer application. The high pressure penetrates the soil and prevents evaporation of the fertilizer. Reducing the fertilizer waste provides a significant savings and assurance of greater crop yields.
- He can apply 28% nitrogen at 30 to 150 units per square acre or Na-Churs® 16/4/8 or 9/18/9 because the pump is corrosion resistant and lasts long under these conditions.
- He can build a unit for one half the price of other fertilizer application units.

This system is equipped with a nozzle selection to accommodate soil types and penetration from 4" to 8" at pressures from 2000 to 3000 PSI.

Direct penetration to the soil region prevents chemical evaporation and assures 25% increased crop yield.

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# APPLICATIONS

## PUMPS



## ROW CROP SPRAYING POTATO FIELDS

File No. 72

### Section 1

#### PROBLEM:

Find a dependable pump to provide an adequate water supply for an 18-row crop sprayer.

#### SOLUTION:

Install a continuous duty compact 6020 pump enabling twice as much application in one half the time.

#### OPERATION:

This farmer was down and out as his existing pump was no longer manufactured and service parts were slow in coming and sometimes not available. He needed a replacement and chose a CAT PUMP because of its proven performance record and reputation for prompt delivery of both pumps and service parts.

Since Smith and Johns Inc. had to do some modification to retrofit the CAT PUMP, they took this opportunity to modify the row crop sprayer. They extended the spray booms to 60 feet (30 feet on each side) to accommodate 112 nozzles total.

They apply the herbicides and insecticides at a constant 450 PSI which is maintained by the system regulator and have a 40 inch spray pattern from each nozzle.

With the modified Ag sprayer, 18 rows can be sprayed in less time and at a much lower cost than the old machine could spray eight rows.

#### SPECIFICATIONS:

CAT PUMPS Model .....	6020
Pressure.....	450-500 PSI
Flow .....	40 GPM
Temperature .....	Ambient
Fluid.....	Water/Fungicides/Pesticides/Herbicides
Duty Cycle .....	Continuous
Drive.....	PTO Tractor

#### BENEFITS:

- Self-contained system including water supply and chemicals.
- PTO drive off the tractor is more economical.
- More efficient and cost effective system: two seasons and no service required.

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# APPLICATIONS PUMPS



## POTATO CLEANING

File No. 127

### Section 1

#### PROBLEM:

Clean mud off potatoes being transferred from the field to the sorting station.

#### SOLUTION:

Install high pressure cleaning system using a CAT PUMP.

#### SPECIFICATIONS:

CAT PUMPS Model .....	*1010
Pressure .....	700 PSI
Flow (2 per nozzle) .....	12 GPM
Temperature .....	Ambient
Fluid.....	Water
Duty Cycle .....	Continuous
Drive .....	7.5 H.P. Electric

\*Alternate CAT PUMP model 390 piston or model 1050 plunger pump.

#### OPERATION:

Potatoes are coated with mud when brought in from the fields. Before they can be routed through the sorter, they must be rinsed. In this particular operation, a special cleaning chamber containing a series of six overlapping nozzles was developed. Each nozzle delivers ambient water at 2 GPM, 700 PSI for a total of 12 GPM.

The potatoes are delivered to the cleaning chamber in baskets which are dumped onto cleaning chamber rollers. These rollers are covered with felt to protect the potatoes from bruising. As the rollers tumble the potatoes, the high pressure rinse washes off the mud. Once the potatoes are cleaned, they are sorted on a long conveyor for further processing.

#### BENEFITS:

- More effective cleaning than by previous hand cleaning method.
- Significant reduction in water consumption.
- Drastically reduced labor costs.
- Dual service available with high pressure pump: stationary cleaning chamber, as well as portable pressure washer for other farm areas and equipment.

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## DISEASE CONTROL HOG WASHING

File No. 139

### Section 1

#### PROBLEM:

Keeping nurseries clean and sanitary while keeping the procedure economical and efficient.

#### SOLUTION:

Installation of a central high pressure cleaning and sanitizing system.

#### SPECIFICATIONS:

CAT PUMPS Model .....	623
Pressure .....	1200 PSI
Flow .....	6 GPM
Temperature .....	100°-180°F
Fluid .....	Water/Sometimes Iodine
Duty Cycle .....	Continuous 8 Hours
Drive .....	7.5 H.P. Electric

#### BENEFITS:

- Higher pressure cuts cleaning time by 75% and water consumption by 35%.
- Installation of a central cleaning system eliminates the need to move cumbersome equipment from place to place and provides better control of bacteria and contamination.
- With more time available, items which previously never got attention, now get cleaned. Since the cleaning process is not longer such a distasteful job, one is more willing to clean and do a good job.

#### OPERATION:

Arnie Meier and Sons at Albany, Minnesota, run a herd of 1,250 S.P.F. (Specific Pathogenic Free) Chester White, Hampshire and Yorkshire swine.

In 1976 Braun Equipment Company installed a central cleaning system for keeping the entire operation clean and sanitized. A single Model 623 CAT PUMP driven by a 7.5 horsepower motor supplies pressurized 180°F water to the entire cleaning system which includes drops in the four farrowing rooms, two nurseries and the sow clean-up room. A regulator on the system permits each station to operate independently or all simultaneously.

When we discussed the benefits of the system with Ron Lin, herdsman for the Meier operation, he told us, "That's the best thing that ever happened here." Clean-up of a farrowing room used to take just over half a day. Now Rod feels he can get a room cleaner in just two hours. The nursery used to be all but impossible to clean. The best attempt to clean was done with shovels. Using the new high pressure cleaning system, Rod said he can really make the nursery look like new with a minimum of time. The system is also used to clean the sows after weaning for inspection.

Saving time is one great way to reduce one's operating costs. Perhaps having a cleaner operation is the only thing that would be more desirable. When a company can accomplish both by installing one piece of equipment, "That's the best thing that ever happened".

The signs posted on the exterior of the buildings indicate how critical sanitation is at this farm. It also shows the value placed on the animals. Keeping the animals clean and healthy protects the farmer's investment. Operating a dependable system to clean and sanitize also protects his investment.

# APPLICATIONS

## PUMPS



## CROP SPRAYING

File No. 141

### Section 1

#### PROBLEM:

Reduce the downtime while in the field, annual pump replacement costs, and irregular spray pattern on edge of field.

#### SOLUTION:

Replace "AG" pump with a proven performance Cat 280 "industrial" pump.

#### SPECIFICATIONS:

CAT PUMPS Model .....	280
Pressure .....	80 PSI
Flow .....	1.5 GPM
Temperature .....	Ambient
Fluid .....	Water/Herbicides/Pesticides
Duty Cycle .....	Sun up to sun down, spring to fall
Drive.....	PTO shaft from tractor connects to pump with pillow block bearing and flexible coupling

#### BENEFITS:

- The first and only CAT PUMP installed had five complete seasons without any downtime or any repair costs.
- Constant pressure provides uniform spray at each turn of the row saving chemical and assuring full coverage.
- Serves as a pressure washer after chemical application adding life to the equipment.

#### OPERATION:

Larry Siebert of Des Moines, Iowa, needed to do something to curb his escalating repair costs and downtime. In a close margin, weather dependent business such as Ag spraying, he needed a pump to apply Ag chemicals that was extremely dependable.

The CAT PUMPS model 280 replaced his previous throw-away pump and proved to be the salvation of his business. After four seasons, over 4000 hours and 2,500,000 gallons of herbicide, he had not spent a dime on repairs or downtime.

Equipped with a regulator, he also saved chemicals and valuable profits because the system was capable of instant pressure at each turn of the row, assuring no wasted chemicals and no untreated soil.

Larry is satisfied that he paid the higher price for his pump because it reduced his costs and resulted in the lowest overall cost and the most value for his dollar.

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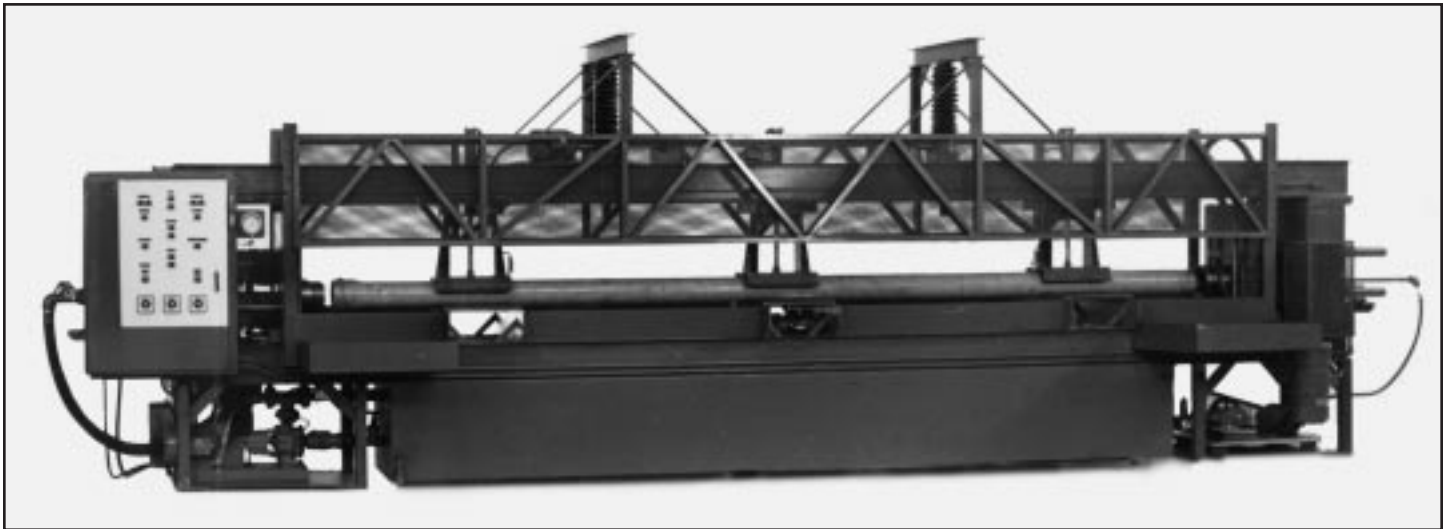
## Hydrostatic Testing

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- 204 Water Extraction

## HYDROSTATIC PIPE TESTING

File No. 106

Section 2



### OPERATION:

Pressure testing of pipes for leaks, seams, cracks or imperfections is an important quality control process, but can prove to be a tedious task. With this automatic hydro-tester, the process is both simplified and consistently monitored.

Various size PVC piping from 4" to 12" and up to 20 ft. long can be tested. The pipe is placed into a bottom V-channel and held in place by an upper V-support block. The heads or end seals are secured and water is fed into the pipe. While the pipe fills, air is vented out. When the pipe is completely filled, the vent is sealed and the pipe is brought up to a predetermined pressure. Both test time and pressure are automatically recorded. The test time varies with the pipe size from 30 seconds to 3 minutes. The pressure the pipe is subjected to will also vary with its intended purpose and rating.

The CAT PUMP has provided a fast, smooth pressure build-up for this application. It has also provided significantly less initial installation costs than previous air activated intensifiers.

The machinery can be tailor made to fit the type of pipe needing testing. Other CAT PUMP models such as the 650 are used with hydraulic fluids to test steel pipe at 1500-2000 PSI.

### PROBLEM:

To find a simplified but consistent pressure testing system for various sizes of pipe.

### SOLUTION:

Install a high pressure CAT PUMP to provide a smooth steady pressure build-up for pressure testing.

### SPECIFICATIONS:

CAT PUMPS Model .....	820
Pressure .....	up to 1000 PSI
Flow .....	up to 10 GPM
Temperature .....	Ambient
Fluid.....	Water
Duty Cycle .....	Continuous
Drive.....	5 H.P. Electric

### BENEFITS:

- Fast smooth pressure build-up.
- Reduced operating costs.
- Compact and lightweight for easy installation.

# APPLICATIONS PUMPS



## OPERATION:

High Water Base Fluids have been around for several years but not until recently have they received widespread interest and usage. H.W.B.F.'s offer many advantages. Because they are generally 95% water, they cost significantly less than petroleum products. H.W.B.F.'s also have the advantage of being readily available, non-polluting and non-compressible. By selecting the appropriate pump, controlling the operating temperatures and checking the water compatibility, H.W.B.F.'s provide numerous advantages and are gaining preference over petroleum products.

In this coal mine, the use of H.W.B.F. is a definite improvement in operation. The Model 6024 CAT PUMP and explosion proof electric motor are stationed outside the mine. The system is equipped with a regulator to maintain precise system pressure. The H.W.B.F. is pumped through hydraulic hoses to the cylinders of several ceiling rams down in the mine. Dependability is a key factor in this operation as the ceiling jacks are supporting the roof of the mine to prevent cave-ins during the removal of coal. With the CAT PUMP they have the security of dependable service and consistent pressure. The design of the CAT PUMP is ideal for handling H.W.B.F. Using the CAT PUMP and H.W.B.F. has reduced the high risk of fires, eliminated the dangerous slippery mine floor previously caused by oil leaking from the hydraulic cylinders and significantly reduced operating costs.

## HYDRAULIC POWER WITH HIGH WATER BASE FLUIDS AND HIGH PRESSURE

File No. 190

Section 2

### PROBLEM:

To eliminate the potentially dangerous conditions caused by oil leaking from hydraulic cylinders in coal mines applications.

### SOLUTION:

Install a CAT PUMP to supply H.W.B.F (High Water Base Fluids) rather than oil to hydraulic cylinders.

### SPECIFICATIONS:

CAT PUMPS Model .....	6024
Pressure .....	5000 PSI
Flow .....	12 GPM
Temperature .....	Ambient
Fluid.....	5% Oil / 95% Water
Drive .....	Electric

### BENEFITS:

- Greatly reduces the fire hazard.
- Eliminates the dangerous slippery mine floor caused by leaking oil.
- Greatly reduces operating costs.
- Consistent fluid delivery and fast pressure build-up.

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# APPLICATIONS PUMPS



## WATER EXTRACTION FOR LAUNDRY AND TEXTILE APPLICATIONS

File No. 204

### Section 2

#### PROBLEM:

To extract as much water as possible from fabric items such as linen, blankets, uniforms, shop towels, etc., in as short a time as possible.

#### SOLUTION:

A Ludell-Hydraxtor Extractor equipped with a CAT PUMP supplies hydrostatic pressure which squeezes excess water from fabric items.

#### SPECIFICATIONS:

CAT PUMPS Model.....	*1010
Pressure.....	400 PSI
Flow.....	12 GPM
Temperature.....	Ambient
Fluid.....	Water
Duty Cycle.....	Continuous
Drive.....	5 H.P. Electric

\*Alternate CAT PUMP model 1050 plunger pump.

#### BENEFITS:

- Reduces dry time up to 47% and significantly cut energy costs.
- Shortened dry cycle and drastically reduced shrinkage.
- Extracts more water than previous system.
- Continuous-duty, low maintenance CAT PUMP eliminates costly downtime.

#### OPERATION:

Industrial and institutional launderers and textile manufacturers have a need to remove excess water from washed fabric to reduce the dry time and energy costs.

At this blanket manufacturer, the washed blankets are placed into a sling which is lowered into a heavy-duty rubber diaphragm in the extractor tub.

The cover securely locks and the CAT PUMP unit automatically pumps 400 PSI of water into the tub to compress the diaphragm and extract the excess water from the blankets. It takes two minutes to bring the system to full pressure and up to 30 minutes to do a complete water extraction.



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## Injection

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- 115 Waste Water Re-Injection
- 129 Boiler Feed Auxiliary Fuel
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- 147 Beer Exciting
- 160 Under Sea Vessel Water Supply
- 223 Golf Course Aeration

# APPLICATIONS

## PUMPS



## SALT WATER INJECTION

File No. 85

Section 3

### OPERATION:

Repeated and costly downtime of an existing 200 GPM pump, delays in securing replacement parts for this pump and a desire to reduce energy consumption provided yet another opportunity for CAT PUMPS to prove its performance, dependability and efficiency.

Now two electrically powered Model 6026 pumps inject a combined 100 GPM of salt water back into the ground. As the crude oil is pumped from the ground, it is delivered to a holding tank where the crude oil and waste water are allowed to separate. The crude oil rises and drains to another tank while the waste water (often brackish) is pumped back into the ground. The CAT PUMPS are activated by a float valve in the tank.

Pressure in the system is maintained by a regulator; the amount of pressure will vary with the soil formation at well sight.

### PROBLEM:

Eliminate the repeated and costly downtime of an existing 200 GPM pump.

### SOLUTION:

Install dual model 6026 CAT PUMPS with a proven record of continuous duty performance in salt water injection.

### SPECIFICATIONS:

CAT PUMPS Model (two) .....	6026
Pressure .....	500 PSI
Flow (each) .....	50 GPM
Temperature .....	Ambient
Fluid .....	Salt Water
Duty Cycle .....	Daily-Intermittent
Drive .....	Electric

### BENEFITS:

- Dual pump system is compact.
- Less horsepower is needed to operate dual pump system.
- Dual pumps allow for continuous operation even during periodic maintenance as one pump can continue working.
- Dependability of CAT PUMP has drastically reduced downtime and operating costs.

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# APPLICATIONS

## PUMPS



## WASTE WATER RE-INJECTION

File No. 115

### Section 3

#### PROBLEM:

To dispose of salt water separated from crude oil without dumping salt water on the ground.

#### SOLUTION:

Include a high pressure CAT PUMP in the salt water removal system to reinject it into the ground.

#### SPECIFICATIONS:

CAT PUMPS Model .....	1016
Pressure .....	700 PSI
Flow .....	10 GPM
Temperature .....	Ambient
Fluid.....	Water
Duty Cycle .....	Continuous
Drive .....	7.5 H.P. TEFC

#### BENEFITS:

- Compact, lightweight unit enables portability and easy installation.
- Simplicity of service allows a quick on-sight periodic maintenance.
- Dependability and longevity of service means minimal downtime.
- Worldwide availability of pumps and parts.

#### OPERATION:

In the process of bringing crude oil out of the ground, a large quantity of salt water or brackish water is also brought up. In the past, this water was dumped on the surface of the ground. Today, due to EPA controls, another means of disposal has been developed. In a typical oil field situation, the crude oil is pumped to a holding tank. After approximately a half day, the crude oil separates from the salt/brackish water, the oil rises to the top of the tank and the waste water and sediment remain at the bottom of the tank. To avoid transfer of sediment with the salt water, the salt water outlet is tapped into the tank about one foot above its bottom. At this level, the hose connects the tank to the inlet of the model 1016 CAT PUMP, which then pumps the salt water back into the ground under high pressure. A regulator with a by-pass routed back to the holding tank maintains constant pressure on the system.

Flow and pressure required for injection may differ significantly from one injection site to another due to variables such as the volume of the salt water, depth of wells and ground density. To improve oil well production, some injection sites are strategically placed, using the injected water to flood the oil well and increase the flow of crude oil.

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# APPLICATIONS

## PUMPS



## BOILER FEED AUXILIARY FUEL

File No. 129

Section 3

### PROBLEM:

Supplying auxiliary fuel during peak energy periods.

### SOLUTION:

Use a CAT PUMP model 2520 to deliver auxiliary oil supply to boiler.

### SPECIFICATIONS:

CAT PUMPS Model .....	2520
Pressure .....	400 PSI
Flow .....	22 GPM
Temperature .....	Ambient
Fluid .....	Fuel Type
Duty Cycle .....	Intermittent service Continuous when needed
Drive .....	7.5 H.P. Electric

### OPERATION:

On the 16th floor of a Detroit office building are nine boilers in operation to provide both the heating and cooling requirements of the building occupants. Normally the boilers are fired by natural gas, however, during extreme weather conditions, both summer heat or winter cold, an auxiliary fuel supply is needed.

For these situations, a CAT PUMP model 2520 delivers 22 GPM of fuel oil at approximately 400 PSI up to the 16th floor to feed the boilers.

When the need for auxiliary fuel exists, the situation is critical and the pump must run without fail. The CAT PUMP has proven itself ready for duty during a complete heating and cooling season without need for service.

### BENEFITS:

- Constant flow and pressure delivered.
- Maintenance free operation.
- Low horsepower, energy efficient operation.
- Eliminates need for two pumps as with previous centrifugal.

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# APPLICATIONS PUMPS



## OPERATION:

Messer Pest Control Inc. of Des Moines, Iowa offers termite control and protection for homes and buildings in the Des Moines area.

The original method required digging around the foundation, drilling a series of holes through the foundation walls and pumping chemicals into the peripheral area. This system was only "satisfactory", required considerable time, created a mess and left a concern for the integrity of the foundation.

With the cooperation of the local CAT PUMP distributor, Messer developed a portable machine to inject chemical faster, with better results and without attacking the foundation.

A lance is inserted into the ground along the foundation to a depth of 6-7 feet. The CAT PUMP delivers 3 GPM of water and pesticide at 600 PSI, enough to penetrate the soil a radius of one foot from the lance. Once the required depth is reached, the gun is shut off, the fluid by-passed to the holding tank and the lance is moved 18" away to the next injection location until the entire building perimeter is completed.

## PEST CONTROL

File No. 140

Section 3

### PROBLEM:

Find a more convenient, economical and effective method to eliminate termites.

### SOLUTION:

Develop a highly portable pressure injection machine equipped with a gun, injection lance and unloader, complete with a gas engine and chemical storage tank.

### SPECIFICATIONS:

CAT PUMPS Model .....	280
Pressure .....	600 PSI
Flow .....	3 GPM
Temperature .....	Ambient
Fluid .....	Water and Pesticide
Duty Cycle.....	Intermittent
Drive .....	Gas Belt Driven

### BENEFITS:

- Portable, extremely efficient process.
- Proven more effective in combating termites than conventional foundation drilling method.
- More appealing to clients because of less mess and no structural affect.

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# APPLICATIONS PUMPS



## OPERATION:

O'Conner Engineering Company created this ship as a scale model of the historic Pacific Northwest Tug "Tattose". This tug was christened "Well Stacked" and was designed and used by O'Conner Engineering to demonstrate the feasibility of steam powered craft for a variety of uses.

This tug has a Model 623 CAT PUMP in the hull of the tug that is direct coupled to the engine with a Paraflex coupling. It is operating at 350 RPM, 350 PSI and delivering 900 pounds of steam per hour. The engine is a two piston, double-acting flow-through type with a variable cut-off valve gear and reverse. The condensers are located on the bottom of the hull next to the keel.

The ship is also equipped with a 3000 watt steam powered turbo generator to supply electric power to the ship while steam is up, as well as to recharge the storage batteries so electrical equipment can still function when there is no steam.

A great deal of precision and energy went into the creation of this scale model tug. Virtually everything on the ship is one-of-a-kind, hand built, top quality.

To maintain the quality of this project and offer the dependability and performance in the system to power this craft, they selected the CAT PUMP.



## STEAM POWER BOILER FEED

File No. 142

### Section 3

#### PROBLEM:

To power a 38 foot, 24 ton scale model of the famous "Pacific Northwest" tug "Tattose".

#### SOLUTION:

To install a high pressure boiler to drive a two piston steam engine coupled to the propeller shaft to turn a 36" x 36" propeller and a 3000 watt stem powered turbo generator.

#### SPECIFICATIONS:

CAT PUMPS Model .....	623
Pressure .....	350 PSI
Flow .....	2.5 GPM
Temperature .....	160°F
Fluid .....	Boiler Water
Duty Cycle .....	Continuous
Drive .....	Direct Coupled to Tug Engine

#### BENEFITS:

- The light weight and compact size of the CAT PUMP makes it ideal for aboard ship.
- Dependability and precise flow are primary reasons for the selection of a CAT PUMP.
- Use of steam power eliminates noxious fumes from internal combustion engines.
- The boiler provides enough power to drive both the main engine and the generator set.

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## SECONDARY RECOVERY-FLOODING

File No. 144

Section 3

### OPERATION:

Flooding is the least expensive and simplest method of enhanced recovery. It makes use of the unwanted waste water which accompanies the oil pumped from the ground, eliminates expensive chemicals or steam heating processes and meets E.P.A. regulations for disposing of the waste water.

Oil is pumped from the ground to holding tanks for the settling of sediment and separation of the oil from the waste water. The waste water is then re-injected back into the ground to increase the well pressure and increase oil output.

Every site varies in flow and pressure required and the quality of waste water. Many sites have brackish and corrosive waste water requiring stainless steel construction. The CAT PUMP provides the flexibility and dependability for this harsh application.

### PROBLEM:

Stimulate oil production once the natural well pressure is exhausted.

### SOLUTION:

Use a high pressure CAT PUMP to inject water back down into the oil reservoir to force out additional oil.

### SPECIFICATIONS:

CAT PUMPS Model .....	*6020
Pressure .....	800 PSI
Flow .....	50 GPM
Temperature .....	Ambient
Fluid .....	Waste Water
Duty Cycle .....	Continuous
Drive .....	15 H.P. Electric

\*Alternate CAT PUMP models 1057 or 3737.

### BENEFITS:

- High pressure injection is an inexpensive process using the waste water to stimulate new production.
- Eliminates dangerous and hazardous chemical reaction or expensive super heating process.
- Dependable, low maintenance CAT PUMP performance reduces downtime and operating costs.
- CAT PUMPS offer flexibility in pump size and construction.



# APPLICATIONS PUMPS



## OPERATION:

Exciting of beer is making beer foam. As the bottles advance through the assembly line they are filled with beer. Just before they are capped, they are charged with a high pressure shot of water which causes the beer to foam or excite. This very important part of the procedure forces gases out of the bottle. Eliminating these trapped gases enhances the flavor and gives the product a longer shelf life. Prior to this method, they tried sonic waves and shaking the bottle. Both methods were ineffective. The new exciting process provides a more consistent quality product with enhanced flavor and longer shelf life.

## BEER EXCITING

File No. 147

### Section 3

#### PROBLEM:

To prolong shelf life of beer and assure good taste.

#### SOLUTION:

Install a high pressure pump to inject a small metered amount of water into each bottle of beer to force air out before being capped.

#### SPECIFICATIONS:

CAT PUMPS Model (two) .....	*281	*621
Pressure .....	350-450 PSI	350-450 PSI
Flow (each) .....	2 GPM	4 GPM
Temperature .....	Ambient	Ambient
Fluid .....	Water	Water
Duty Cycle.....	Continuous	Continuous
Drive .....	3/4 H.P. Electric	1.5 H.P. Electric

*\*The number and size of pumps vary with production requirements.*

#### BENEFITS:

- Eliminates expensive mechanical failures of old system.
- Improves production time and quantity.
- Provides more consistent exciting.
- Reduces bottle breakage and beer spilling.



A control valve monitors the fractional second injections into each bottle as they pass under the nozzles.

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# APPLICATIONS

## PUMPS



## WATER SUPPLY FOR UNDER SEA VESSELS

File No. 160

### Section 3

#### PROBLEM:

Providing adequate and continuous flow of fresh water saturated chamber systems and warm water to diving excursion bells.

#### SOLUTION:

Develop a water supply system using a high pressure stainless steel CAT PUMP to maintain constant pressure and water flow to depths of 1000 feet below sea level.

#### SPECIFICATIONS:

CAT PUMPS Model .....	*1012
Pressure .....	700 PSI
Flow .....	12 GPM
Temperature .....	105°F
Fluid .....	Water/Sea Water
Duty Cycle .....	Continuous
Drive .....	7.5 H.P. Electric w/Variable Pitch Pulley Regulator and Pulsation Dampener

\*Optional CAT PUMP model 1051 S.S. plunger pump.

#### BENEFITS:

- Portable, compact, lightweight pump.
- Continuous, dependable flow and pressure.
- Energy efficient low H.P. operation.
- Smooth flow - minimum pulsation.

#### OPERATION:

When diving chambers (under sea vessels) are below sea level, it is necessary to keep the water supply pressurized at 10% above external sea water pressure. At 1000 feet, which is the maximum diving depth of the chambers to date, 499 PSI is required. A Model 1012 CAT PUMP, mounted on a barge, is used to transfer fresh water down to the chamber system. A regulator maintains 700 PSI on the system to provide continuous pressurized fresh water supply to water system of the chambers for showers, drinking and other standard uses.

This system is also used to pump 105°F hot water from the boiler on the barge through a heat radiating system around the individual diving bells. This warm water is also pumped through

small veins in the divers wet suits to keep them warm. By using a stainless steel unchromed pump, heated sea water (rather than fresh water) can be used to warm the bells. This is less expensive, because the sea water can be returned to the sea rather than recirculated.

These life support chambers are submersed and under pressure for long periods, therefore it is essential that a constant supply of pressurized fresh water be provided. It is also important for the divers at greater depths to be kept warm to aid their mobility and maintain efficiency.



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# APPLICATIONS

## PUMPS



Photo compliments of Rogers Innovative Inc., Saskatoon, Saskatchewan

## POLYMER INJECTION GOLF COURSE AERATION

File No. 223

Section 3

### PROBLEM:

Golf course greens, fairways, and tee boxes suffer from burnup or dry out, due to lack of oxygen caused by high traffic compression and heat stress.

### SOLUTION:

A portable CAT PUMP powered system provides fast aeration to compacted and heat stressed, high traffic greens, tee boxes and fairways.

### SPECIFICATIONS:

CAT PUMPS Model.....	3507
Pressure .....	5000 PSI
Flow .....	9 GPM
Temperature .....	Ambient
Fluid .....	Water/Polymer
Duty Cycle.....	Intermittent
Drive .....	Hydraulic PTO

### BENEFITS:

- Low capital investment and operating cost.
- Fast and easy, ride-on, one-man operation.
- No downtime or lost income with immediately playable surface.
- Reduced water and chemical consumption.
- Immediate, effective relief for stressed turf.

### OPERATION:

Golf course greens, tee boxes, and fairways suffer the adversities of compaction and heat stress. Aeration and liquid volume injection provide an economical solution to this problem.

Injection of a liquid directly into the root zone from .5" to 8" deep will provide immediate relief. Multiple orifice nozzle tips are spaced 3" apart and can be adjusted on-the-go through an electronic controller. Adjustments can increase the frequency of jetting in 1" to 6" of travel.

Fluid is fed to the pump from a portable 100 gallon tank mounted above a set of rollers. These two 48" width rollers smooth the turf surface after the injection, leaving no surface contamination and permitting immediate grounds use.

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## Surface Preparation

- 32 Flash Removal
- 47 Cedar Siding Restoration
- 104 Debarking
- 121 Phosphatizing Farm Implements
- 175 Ship Hull Wet-Sandblasting

# APPLICATIONS

## PUMPS



Photos compliments of Forward Technology, Minneapolis, Minnesota

### OPERATION:

In the production of plastic injected parts, it is common to see flash form at the parting lines of the mold. Flash is excess plastic that has been forced out between the mold plates during the injection process.

For companies producing a high volume of parts, deflashing can add hours to producing a finished product, if the process is not efficient and effective. This inefficiency adds to the production costs and can extend delivery schedules.

Forward Technology Industries, Inc. of Minneapolis, Minnesota has produced a system using high pressure water with automated machinery for deflashing molded parts. These parts are loaded into a hopper, sorted and then loaded into special holders. Several nozzles delivering 4000 PSI of water are precisely aimed at each part for total removal of flash. Each part is deflashed in 1.25 seconds. One person, operating two systems, deflashes 5760 parts per hour, significantly reducing labor cost and lead time on each part.

## FLASH REMOVAL

File No. 32

Section 4

### PROBLEM:

To find a fast, efficient method for total removal of flash on molded plastic parts.

### SOLUTION:

Use high pressure water in a specially designed automated system.

### SPECIFICATIONS:

CAT PUMPS Model (three).....	3507
Pressure .....	4000 PSI
Flow .....	27 GPM
Temperature .....	125°F
Fluid.....	Water
Duty Cycle .....	Continuous
Drive (three).....	25 H.P. Electric

### BENEFITS:

- Removes flash at a rate of 1.25 seconds per part.
- Only requires one person, operating 2 systems to deflash 5760 parts per hour.
- Significantly reduces lead time for parts.
- Dependable, continuous duty CAT PUMP assures system "up time" and minimizes maintenance "downtime".



Closeup of Power Unit drive source.

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Before Cedar siding restoration



After Cedar siding restoration

**OPERATION:**

A portable high pressure cleaning system is extremely easy to operate and allows cleaning at ground level as well as second story locations.

The initial high pressure cleaning is done with a 25° angle nozzle held about 12" from the surface. A water and chlorine solution is used to blast free the mildew. Mildew, moisture and sun, darken wood and this chlorine treatment bleaches the wood as it kills the bacteria. After thoroughly cleaning the cedar, a sealant is applied to preserve the wood and reduce the occurrence of mildew for another 2-3 years.

**CEDAR SIDING RESTORATION**

**File No. 47**

**Section 4**

**PROBLEM:**

Sun and mildew attacking exterior cedar siding, decks and fences and destroying the wood surface, structure and appearance.

**SOLUTION:**

Use a high pressure chemical wash system to clean and treat surface.

**SPECIFICATIONS:**

CAT PUMPS Gearbox Model.....	51G1
Pressure .....	2500 PSI
Flow .....	4 GPM
Temperature .....	Ambient
Fluid .....	Chlorinated Water
Duty Cycle.....	Intermittent
Drive .....	Gas Engine

**BENEFITS:**

- Prolongs life of cedar.
- Improves appearance and home value.
- Restores wood to natural color.
- Very effective and easy to use.
- Preservation reduces replacement costs.



## DEBARKING

File No. 104

Section 4

### OPERATION:

A diesel powered CAT PUMP model 6024 proves effective in removing bark from freshly cut white oak. This high pressure debarker follows the line of the bark and avoids costly downtime due to jams common in mechanical debarkers.

Mechanical debarking has been the best known means of removing bark, however it has many shortcomings. The initial cost generally runs in excess of \$25,000 and the expensive tungsten carbide chippers must be replaced every three days. Mechanical devices require constant preventative maintenance and are easily jammed with crooked or knotted logs.

Through testing it has been found that 12 GPM, 5000 PSI and a 0° nozzle can effectively remove bark from freshly cut white oak. Using high pressure water for debarking eliminates timely and costly jams, cleans the logs before milling, increases saw blade life, provides better paper products and a cleaner operation for reduced costs.

### PROBLEM:

To find a better method of removing bark than the standard mechanical process.

### SOLUTION:

Develop a high pressure water debarking system.

### SPECIFICATIONS:

CAT PUMPS Model .....	6024
Pressure .....	5000 PSI
Flow .....	12 GPM
Temperature .....	Ambient
Fluid.....	Water
Duty Cycle .....	Continuous
Drive .....	Diesel Engine

### BENEFITS:

- Reduces the initial investment costs.
- Avoids expensive daily maintenance and constant preventative maintenance.
- Eliminates jams and waste due to crooked or knotted logs.
- Reduces downtime.
- Eliminates costly replacement of “chippers”.

# APPLICATIONS PUMPS



The dual CAT PUMPS deliver to the spray booth to assure sufficient flow and acid treatment.



## OPERATION:

This Canadian company manufactures a variety of farm equipment. They had a totally automated assembly line except for the by hand process of acid washing and rinsing production parts, which was causing a real bottleneck in their operation. After some evaluation of the situation, a spray booth was designed to replace the old time-consuming hand method. Two CAT PUMPS were installed; one for the acid application, the other for rinsing.

As the equipment advances along the overhead conveyor through the spray booth, oscillating nozzle arms move up and down and side to side to assure complete coverage with the acid. After the acid is applied, the parts are rinsed with clear water and proceed to be dried and painted. The acid is recycled and goes through special filters to purify it for the next application.

With the new spray booth, the assembly line runs much smoother. There is no tie-up of parts at the point of phosphatizing, they have better coverage and they have reduced production expenses. In addition, the dual 1044 pumps are available for other pressure cleaning functions and with a sandblast attachment, provide wet sandblasting for deburring and other surface preparations.

## PHOSPHATIZING FARM IMPLEMENTS

File No. 121

Section 4

### PROBLEM:

To find a more efficient method of applying phosphoric acid and rinsing afterward.

### SOLUTION:

Add to the manufacturing assembly line, a spray booth featuring CAT PUMPS high pressure pump for acid application and rinse.

### SPECIFICATIONS:

CAT PUMPS Model (two) .....	*1044 S.S.
Pressure .....	500+ PSI
Flow (each) .....	10 GPM
Temperature .....	Ambient
Fluid .....	20:1 Water and Phosphoric Acid
	Clear Water Rinse
Duty Cycle .....	Continuous
Drive .....	Electric

\*Alternate CAT PUMP model 1051 plunger pump or 822 piston pump.

### BENEFITS:

- Faster automated process to complement the balance of the production line.
- Better application of acid.
- Reduced operating expenses.



There are several arms in the spray booth. Low pressure and high flow is best for this acid application.



This conveyor load of parts has been treated with acid, thoroughly rinsed, dried and is now heading for the paint booth.

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# APPLICATIONS

## PUMPS



### OPERATION:

High pressure water blasting is done above and below water. It is a very controllable cleaning process. The pressure and flow can be adjusted for any cleaning job from removing surface dirt to stripping chipped paint or barnacles. High pressure cleaning is a flexible cleaning system also. It can be a portable, manual system with several guns to accommodate hard-to-get-at spots or a portable, automatic system with a specially designed oscillation nozzle arm to follow the whole contour of the ship's hull.

A CAT PUMP is part of a truck-mounted, diesel-powered manual system. The manual system was chosen because it can adapt to the varied cleaning jobs of this contractor who refurbishes small pleasure craft, as well as, larger commercial vessels. The pump delivers 12 GPM and 5000 PSI of water to remove the most stubborn attackers of these ship hulls. When paint is removed, a rust inhibitor is used to prevent further rust development until the vessel is repainted. It has been found that high pressure blasting is much more effective than the old by-hand method with brushes and scrapers in removing the rhizoid of weed spores or barnacles. The old cleaning methods didn't get at the root of the problem and the growth quickly reappeared. When the cleaning task is especially stubborn, this cleaning system can be quickly converted to a wet-sandblaster.

## SHIP HULL WET-SANDBLASTING

File No. 175

### Section 4

#### PROBLEM:

Removal of rust, paint and barnacles from ship hulls in dry dock.

#### SOLUTION:

Use a CAT PUMP high water blaster to clean and prepare vessels for repainting.

#### SPECIFICATIONS:

CAT PUMPS Model.....	*6024
Pressure.....	Varies up to 5000 PSI
Flow.....	Varies up to 12 GPM
Temperature.....	Ambient
Fluid.....	Water, Rust Inhibitor
Duty Cycle.....	Intermittent
Drive.....	3 Cylinder Diesel

\*Optional CAT PUMP model 3507 plunger pump.

#### BENEFITS:

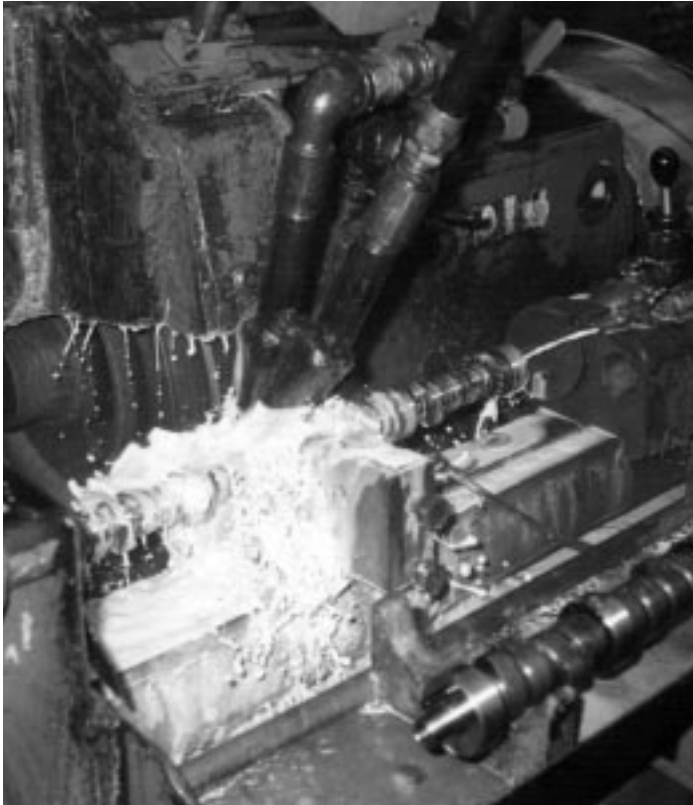
- Portable for mobility.
- Provides environmentally cleaner process than dry sandblasting.
- Reduces manpower saving time and money.
- Offers versatility from pressure cleaning to wet sandblasting.
- Improves operation of ship saving time, fuel costs and prolongs life of ship.
- Dependable low maintenance pump operation offers continuous 24 hour cleaning capability.

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## Metering

55 Camshaft Cooling

75 Crude Oil Transfer



## CAMSHAFT COOLING WITH HIGH PRESSURE

File No. 55

Section 5

### PROBLEM:

Holding close tolerance and low operating expenses are high priorities for this camshaft manufacturer. The existing process was interrupted by frequent and expensive downtime.

### SOLUTION:

CAT PUMPS dependable continuous duty, performance solved the downtime problem, while its fast response pressure build-up improved quality and production.

### SPECIFICATIONS:

CAT PUMPS Model (three).....	550
Pressure .....	2800 PSI
Flow (each) .....	9 GPM
Temperature .....	Ambient
Fluid .....	Machine Oil
Duty Cycle .....	Continuous
Drive .....	Electric

### BENEFITS:

- Instant pressure from the CAT PUMP powered system means less energy and drastic increase in horsepower efficiency.
- Consistent pressure means less grinding time.
- No air means less operating expense.
- No air means less initial installation costs.

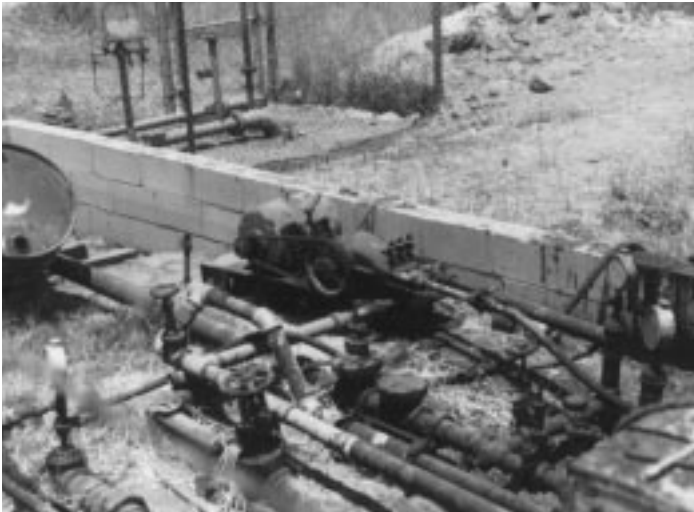
### OPERATION:

Three CAT PUMPS model 550 have been running smoothly since October 1980 delivering machine coolant to six camshaft grinders. This high pressure coolant flushes the cuttings and cools the metal during grinding to assure closely held tolerances. The coolant is filtered down to 10 micron and recirculated. The fast pressure build-up of the CAT PUMP puts them on-line immediately upon demand. A constant system pressure is maintained with a regulator.

Many advantages were recognized when CAT PUMPS replaced the six air operated pumps previously on this system. "Savings" summarizes all these advantages. Now this company has a better product that costs less and takes less time to produce.

# APPLICATIONS

## PUMPS



## CRUDE OIL TRANSFER PUMP

File No. 75

Section 5

### OPERATION:

A small West Coast oil company is currently using a CAT PUMP to transfer crude oil from the well site to storage tanks.

High pressure is necessary because the crude oil is being pumped approximately two miles under the city's streets to the storage tanks. With this distance, 40-50% of the system pressure is lost. The CAT PUMP can deliver a consistent flow and high pressure to cover the line loss and still meet system requirements. The wells are pumping 24 hours a day and the oil company needs a pump to meet this demand. The CAT PUMP was chosen because of its proven continuous duty performance and low maintenance. Installing the CAT PUMP has eliminated costly downtime and repair costs common with previous pumps. It has also saved a considerable expense by eliminating the relocating and building of new storage tanks near the wellsite.

### PROBLEM:

Transfer crude oil one mile under city streets to storage tanks.

### SOLUTION:

Install a high pressure, continuous duty, CAT PUMP to assure a steady flow.

### SPECIFICATIONS:

CAT PUMPS Model .....	2520
Pressure.....	400-600 PSI
Flow .....	25 GPM
Temperature .....	Ambient
Fluid .....	Crude Oil
Duty Cycle .....	Continuous
Drive.....	Electric

### BENEFITS:

- Reduces maintenance cost.
- Eliminates costly downtime.
- Delivers consistent high pressure/flow.
- Eliminates costly relocation or installation of new storage tanks.

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## **Pressure Cleaning Industrial**

- 68 Ceramic Tile Plant
- 97 Battery Cleaning
- 120 Filter Cleaning
- 132 Live Wire Insulator Washing
- 134 Felt and Wire Screen Washer
- 137 Meat Processing Plant
- 143 Oil Storage Tank Cleaning
- 145 Total Wash System
- 150 Cleaning Heating/Cooling Coils
- 152 Offshore Platform Washdown
- 161 Sander Belt Cleaning
- 166 Cleaning Compressor Castings
- 168 Seal Gland Flushing
- 208 Central Cleaning System - Deli
- 213 Sponge Factory Cleaning
- 218 Tube Cleaning
- 222 Screen Cleaning

# APPLICATIONS

## PUMPS



## HIGH PRESSURE CLEANING IN CERAMIC TILE PLANT

File No. 68

Section 6

### PROBLEM:

This tile manufacturer was requiring over 4 hours to clean three 700 gallon mixers yet still could not do an adequate job. It was costing time and wasted man hours to do the job.

### SOLUTION:

Now a CAT PUMP powered portable cleaning system is in operation cutting cleaning time from 4 hours down to 40 minutes with high pressure.

### SPECIFICATIONS:

CAT PUMPS Model .....	310
Pressure .....	2000 PSI
Flow .....	3 GPM
Temperature .....	Ambient
Fluid.....	Water
Duty Cycle.....	Intermittent
Drive .....	Electric

### BENEFITS:

- Cleaning time cut by 80% enabling more production time.
- Product quality-control greatly assisted with more thorough cleaning.
- Equipment maintenance simplified.
- Portability and simplicity makes cleaning less tedious a task.

### OPERATION:

This is a success story from beginning to end. The plant maintenance manager of this ceramic tile manufacturer saw CAT PUMPS' advertisement in N.E.D. and wrote for more information. Literature was mailed and our distributor, Power Wash Service, was informed of their interest. Within 4 weeks Power Wash Service had made the sale and the maintenance manager was in operation.

The portable cleaning unit was designed to clean three mixers used to grind earth and water to produce clay for ceramic tile. The goal of the wash unit was to do a more efficient cleaning of the mixers. This improved cleaning would improve production time and assure better quality control. All objectives were accomplished and with remarkable savings.

The cleaning time for the three 700 gallon mixers was cut from approximately 4 hours to 30-45 minutes. This 80% reduction in cleaning time significantly improved plant production. In addition to less time and less men required to do the cleaning, a more thorough cleaning was accomplished eliminating and left over color residue which might spoil the next tile mix.

With the convenience of this portable high pressure cleaner, the entire plant became a target for frequent cleaning; including floors, stairs, catwalks and forklifts. Worker safety was improved and equipment servicing was made more convenient.

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## BATTERY CLEANING

File No. 97

Section 6

### OPERATION:

The old battery cleaning process was not efficient or economical, requiring five men with rubber gloves and acid, thousands of gallons of water and high energy costs to heat the blow dryers. The output was a disappointing 1600 batteries per 16 hour shift.

Industrial Cleaning Systems of Winnipeg designed a new system fashioned after a drive-thru car wash, minus the brushes. The batteries pass through the cleaning chamber after being filled with acid and tested. They are sprayed with 140°F soapy water from six specially placed nozzles, rinsed and cool air dried. This simple process has increased production to 4500 batteries in a 16 hour shift.

### PROBLEM:

To find a more efficient cleaning process for batteries following acid fill.

### SOLUTION:

Install a CAT PUMP in high pressure cleaning system.

### SPECIFICATIONS:

CAT PUMPS Model .....	820
Pressure .....	1000 PSI
Flow .....	8 GPM
Temperature .....	140°F
Fluid .....	Water and Detergent
Duty Cycle.....	Continuous 16 hour shift
Drive.....	Electric Motor

### BENEFITS:

- 64% production increase.
- Better cleaning accomplished.
- Drastic reduction in water consumption, energy costs and manpower.
- Less space required for new system.

# APPLICATIONS PUMPS



## OIL SEPARATION FILTER CLEANING

File No. 120

Section 6

### OPERATION:

Many industrial operations have a need for oil/water separators. Hyde Products Company in Ohio manufactures separators to meet these needs. With their system, they feel it is essential to include a portable high pressure cleaner to insure effective operation of the separator. The separators vary in size from very small 2 GPM to larger 1000 GPM systems. They incorporate removable filters which accumulate oil and other non-solubles from the fluid being filtered. These filters must be periodically cleaned in order for the separator to remain effective. High pressure water does a more thorough job of cleaning these filters in less time than other cleaning methods. In extreme cases, solvents and higher pressure water are necessary to do the most effective cleaning.

### PROBLEM:

To keep oil/water separators working effectively.

### SOLUTION:

A high pressure cleaner using a CAT PUMP for cleaning oil and other nonsoluble debris from filters in the separators.

### SPECIFICATIONS:

CAT PUMPS Model .....	*280
Pressure .....	600 PSI
Flow .....	2.5 GPM
Temperature .....	Ambient
Fluid .....	Water/Solvents
Duty Cycle.....	Intermittent
Drive .....	1.5 H.P. Electric

\*Alternate CAT PUMP model 290 piston pump or 270 plunger pump.

### BENEFITS:

- Portability of unit simplifies cleaning process and adapts to any size system.
- High pressure water does more effective job than city water pressure.
- Heavy-duty, maintenance free pump operation provides a dependable cleaning system.

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# APPLICATIONS

## PUMPS



## LIVE WIRE INSULATOR WASHING

File No. 132

### Section 6

#### PROBLEM:

To clean insulators without interruption of electrical service.

#### SOLUTION:

Design a truck mounted high pressure washer.

#### SPECIFICATIONS:

CAT PUMPS Model .....\*6020  
 Pressure .....700 PSI  
 Flow .....60 GPM  
 Temperature .....Ambient  
 Fluid.....Water  
 Duty Cycle.....Intermittent  
 Drive .....PTO

\*Alternate CAT PUMP model 6767 plunger pump.

#### BENEFITS:

- Compact, lightweight mobile unit accommodates the many set-ups necessary each day.
- Dependable, low maintenance operation provides the continuous service needed for the frequent insulator washing.
- Fast cleaning done in just 15 seconds.
- Economical cleaning done without interruption of electrical service.

#### OPERATION:

Southern California Edison (S.C.E) put the pressure on one of their cleaning problems by using CAT PUMP in their specially designed equipment to clean high voltage transmission line insulators.

Dust, smog, salt or other pollutants collect on high voltage insulators. These materials can become conductors of electricity, which will reduce the effectiveness of the insulator and cause problems in electrical service such as short circuits.

During the dry season in parts of southern California, high voltage insulators can require cleaning as often as every two months, depending upon the amount of rainfall.

Any conventional means of cleaning this residue from the insulators would mean shutting down the lines and interrupting service to homes, offices, schools and businesses.

S.C.E. has a washing fleet of 50 trucks, each capable of carrying 1200 to 4000 gallons. Each truck is equipped with a hydraulically-actuated boom, 75 to 100 feet long, which is used to get the nozzle close enough to the insulators for effective cleaning.

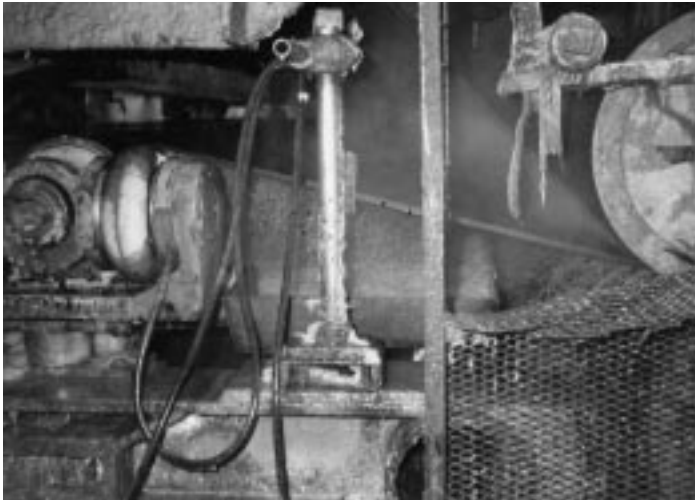
Time for set-up must be kept to an absolute minimum. The special trucks, built to S.C.E.'s specifications, have hydraulic leveling jacks at the rear corners, which are controlled by the boom operator. A unit can be set up quickly, which is critical, considering the many hundreds of set-ups necessary each day, for each truck.

Thanks to a unique nozzle developed by the S.C.E. engineers, an insulator can be washed in only 15 seconds from just one location without any power interruption.

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# APPLICATIONS

## PUMPS



## FELT AND WIRE SCREEN WASHER

File No. 134

### Section 6

#### PROBLEM:

To improve the life of paper mill felts and wire screens.

#### SOLUTION:

Install a high pressure spray cleaning system using a model 6020 CAT PUMP.

#### SPECIFICATIONS:

CAT PUMPS Model .....	6020
Pressure .....	900 PSI
Flow .....	50 GPM
Temperature .....	Ambient
Fluid .....	Cold Water
Duty Cycle .....	Continuous
Drive .....	500 H.P. V-Belt

#### BENEFITS:

- Longer lasting screens due to regular cleaning.
- Better paper product due to better moisture removal with clean felts and wire screens.
- Convenience of screen and felt cleaning because it is part of the paper process.
- CAT PUMP maintenance-free operation reduces paper mill downtime.

#### OPERATION:

The paper mills run a rigorous schedule of 24 hours a day, 7 days a week, often for 6 to 12 months without any shutdowns. It is important all equipment be in good working order. Because of the continuous duty, maintenance free operation of the CAT PUMP, it is ideally suited for these heavy demands. There are several steps in the process of converting wood to paper. Two of these steps involve removing water from the cellulose fiber using wire screens and felts.

Cellulose sticks to both the wire screen and the felt. Below each is a 10 foot pipe approximately two to three inches in diameter containing up to 24 nozzles. This apparatus oscillates and sprays cold water on the screens and felts to remove trapped particles before returning to receive another application of wet cellulose.

Using a CAT PUMP high pressure system for this cleaning increases screen life, reduces downtime and helps assure a quality product.



After logs are debarked, the wood is run through a grinder and chopped into 5/8" chips. The chips are then cooked to remove the lignum and leave only a cellulose material. Water is added and the pulp advances to the wet end of the paper machine called the trough.

The pulp is spread on a wire screen and passed over a suction box containing a vacuum pump to remove approximately 70% of the water. After the wire screen, the paper sheet slides onto the felt, which soaks additional water from the paper product. Both the felt and the wire screen need regular cleaning to do an effective job.



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# APPLICATIONS PUMPS



## CENTRAL CLEANING SYSTEM MEAT PROCESSING PLANT

File No. 137

### Section 6

#### OPERATION:

The USDA has stringent sanitation requirements for the food industry. Failure to meet these requirements means a costly plant shut-down until the plant meets the test.

In one of the larger US meat processing plants, 375,000 pounds of hamburger are processed each day for a single food chain. Any delay in this large production would result in a costly error for both the meat processing plant and the food chain.

In preparation for the daily inspection, the plant is thoroughly washed down each day between 11:00 pm to 7:00 am. Because it is essential to pass this USDA inspection "daily", great emphasis is placed on a dependable and efficient cleaning system. The CAT PUMP'S long life and easy maintenance make it ideal for the application. Three Model 2520 Pumps supply a continuous flow of water to eleven strategically placed cleaning stations. Down stream from the pumps, the water is heated by a boiler. At 700 PSI, this solution of hot water and sanitizer cleans everything: floors, ceilings, conveyors, etc. Each morning before start-up, the inspector checks the plant, takes a series of bacteria cultures and gives the "go" or "no go" to start the operation.

#### PROBLEM:

To meet the daily sanitation inspection of USDA inspector.

#### SOLUTION:

Installation of a central cleaning system using a CAT PUMP.

#### SPECIFICATIONS:

CAT PUMPS Model (three) .....	*2520
Pressure .....	700 PSI
Flow .....	75 GPM
Temperature .....	Ambient
Fluid.....	Water
Duty Cycle .....	Continuous 8 hrs. per day
Drive (three).....	15 H.P. Electric

\*Alternate CAT PUMP models 2530 or 3520 plunger pump.

#### BENEFITS:

- Dependable service for reduction of costly downtime.
- Heavy duty continuous flow and pressure availability.
- Adaptability to multiple drop stations.
- Easily serviced.

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# APPLICATIONS PUMPS



## OIL STORAGE TANK CLEANING

File No. 143  
Section 6

### PROBLEM:

To find a more efficient method of cleaning oil storage tanks.

### SOLUTION:

Incorporate a high pressure pump in a complete pollution control/tank cleaning truck mounted system.

### SPECIFICATIONS:

CAT PUMPS Model .....	*1024
Pressure .....	3000 PSI
Flow .....	6 GPM
Temperature .....	Ambient
Fluid .....	Water/Chemicals
Duty Cycle .....	Continuous
Drive.....	Hydraulic

\*Alternate CAT PUMP model 650 plunger pump.

### BENEFITS:

- Provides significant time savings: what formerly took two weeks, now takes less than two days.
- Results in a better clean-up: Former hand method removed the sludge but could not clean the tank surfaces as the high pressure does.
- Offers versatility: system can be used for oil spillage clean-up at any location with a chemical high pressure washing of the area after oil removal. This unit is also easily adapted to fire protection.

### OPERATION:

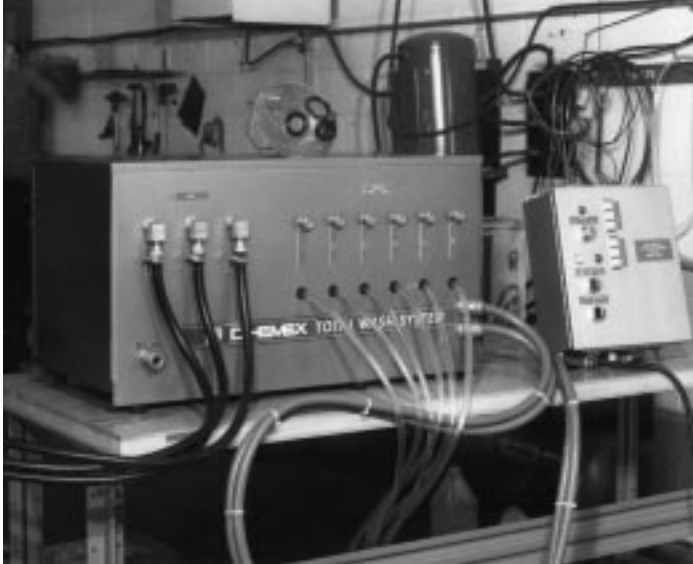
After a period of time, sediment and oil film accumulate at the bottom of oil storage tanks. To replace the time consuming and inefficient traditional manual method of removing this sludge, a self-contained truck-mounted cleaning system was developed containing a vacuum and a high pressure pump. With this system only one man enters the tank to handle the clean-up. A CAT PUMP operating at 6 GPM, 3000 PSI, complete with an unloader, a nozzle and a 5000 pound shutoff gun blasts the inside surfaces of the tank, cleaning to the bare metal. This system also contains its own water supply and chemical feeder for the cleanup. Once the tank surfaces are cleaned, a rotary vacuum pump sucks the sludge and water from the oil tank into the holding tank on the truck.

The "Super Sucker" has a compact pump drive unit with water and hydraulic controls conveniently mounted behind the cab of the truck for easy monitoring of the operation.



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# APPLICATIONS PUMPS



## TOTAL WASH SYSTEM (Cleaning Gas Masks)

File No. 145

Section 6

### OPERATION:

A 3-horsepower electric motor with a v-belt powers a CAT PUMP to deliver 3 GPM at 1000 PSI to the wash system. An electronically controlled panel is set up so the operator can select from three different inlet fluids and six different chemicals injected downstream. The plastic parts advance down a conveyor to a small vertical section with six stationary nozzles. This series of specially placed nozzles directs the fluids for cleaning—three clean the inside while three clean the outside of the plastic masks. The system also dries the products upon completion of the wash cycle.

### PROBLEM:

To remove oil from large production quantities of molded plastic products.

### SOLUTION:

Installation of high pressure Total Wash System using a CAT PUMP.

### SPECIFICATIONS:

CAT PUMPS Model .....	333
Pressure .....	1000 PSI
Flow .....	3 GPM
Temperature .....	Ambient
Fluid .....	Distilled Water, Tap Water, Alcohol
Duty Cycle .....	Continuous
Drive .....	3 H.P. Electric

### BENEFITS:

- A significant time savings over the original hand cleaning method.
- Provides better removal of oil film from production items than the original hand method.
- Less costly than the original hand method.

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# APPLICATIONS PUMPS



## CLEANING HEATING AND COOLING COILS

File No. 150

Section 6

### PROBLEM:

To establish preventative maintenance for heating and cooling equipment.

### SOLUTION:

Build a portable high pressure cleaner.

### SPECIFICATIONS:

CAT PUMPS Model .....	*323
Pressure .....	1000-1500 PSI
Flow .....	4.5 GPM
Temperature .....	Ambient
Fluid .....	Water
Duty Cycle .....	Intermittent
Drive .....	5 H.P. Electric

\*Optional CAT PUMP model 310 plunger pump.

### BENEFITS:

- Eliminates costly malfunctions.
- Convenient, lightweight, portable unit.

### OPERATION:

The Renaissance Center in Detroit is a very beautiful and large complex housing a hotel, shopping mall and many other businesses. Because of the large number of people occupying this structure, it is important that the heating and cooling system be in top operating condition at all times. For this reason special attention has been given to "preventative maintenance" to avoid costly malfunctions and service.

A portable pressure cleaner was designed to handle the cleaning of the heating and cooling coils. Over a period of time dust and dirt accumulates on these coils which will increasingly reduce the efficiency of the unit. With the high pressure sprayer this cleaning is a very convenient, thorough process and takes place on a regular schedule to avoid any build-up of dirt in grooves and crevices of the coils.

Because the unit is portable, it is also used for a variety of cleaning projects throughout the entire center, adding to the center's appearance, safety and longevity.



The coils are difficult to clean because of their poor accessibility and design. The portable washer makes the task conveniently feasible.

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# APPLICATIONS

## PUMPS



## OFFSHORE PLATFORM WASHDOWN

File No. 152

Section 6

### PROBLEM:

To find an economical cleaning system for offshore platforms.

### SOLUTION:

Incorporate a low maintenance, dependable high pressure CAT PUMP in the cleaning system.

### SPECIFICATIONS:

CAT PUMPS Model .....	650
Pressure .....	3000 PSI
Flow .....	7 GPM
Temperature .....	Ambient
Fluid .....	Freshwater
Duty Cycle .....	Continuous
Drive .....	Diesel Engine

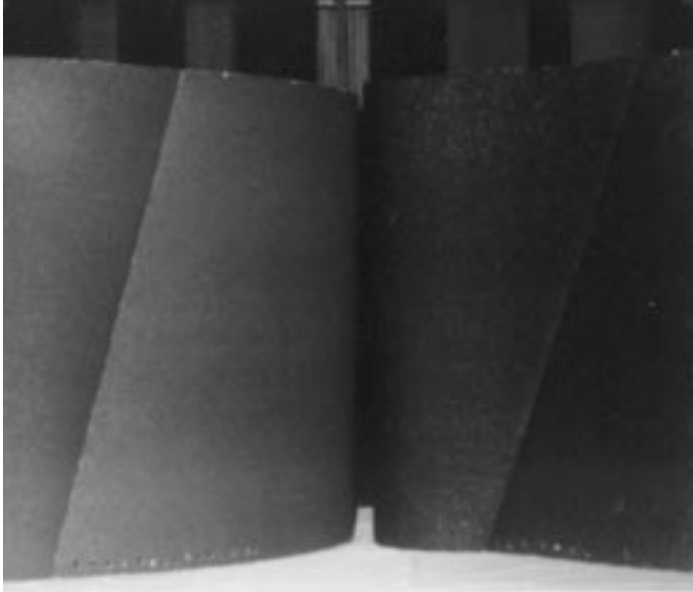
### OPERATION:

As represented by the above photo, there are numerous offshore platforms throughout the world in need of regular cleaning to prevent excessive wear on equipment and to provide safer operating conditions. Grease and oil which have accumulated on cat walks, stairs, etc., can be quickly and effectively removed with high pressure. The efficient CAT PUMP is a vital part of the cleaning system. With this convenient and effective routine cleaning, equipment is kept in good working order, reducing potential problems which could develop into major breakdowns. To combat the salt water corrosion problem, a wet-sandblasting assembly can be quickly attached. Wet-sandblasting is dust free which eliminates health hazards as well as dust coated equipment which could result in improper operation.

### BENEFITS:

- Dependable, maintenance-free operation offers continuous service.
- Low horsepower energy efficient operation.
- Convenient portable unit encourages frequent cleaning and safer operating conditions.
- Adaptable from pressure cleaning to wet-sandblasting.

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Holes indicate number of cleanings.

**OPERATION:**

Industries such as furniture manufacturers use large sanding belts to finish and shape their products. These belts are commonly 3" to 50" wide and 6' to 11' long. They cost between \$30 and \$60 and are typically used until "loaded", then discarded.

A special high pressure cleaning system by Chatham Sander Belt Service of Siler City, N.C. provides an economical alternative. These belts can now be cleaned for as little as \$6 to \$8. Typically they are cleaned 4 to 5 times, but some as many as 12 or 15 times.

A special spray bar containing 8 specially machined "0" degree ultra fine nozzles travels across the belt as it rotates at sanding speed over rollers. The high pressure flushes away the grit while the centrifugal action prevents the belt from getting soaked and ruined.

**SANDER BELT CLEANING**

**File No. 161**

**Section 6**

**PROBLEM:**

Reduce the high cost of replacing dirty sanding belts.

**SOLUTION:**

Develop an effective cleaning process resulting in less frequent belt replacement and cost reduction.

**SPECIFICATIONS:**

CAT PUMPS Model .....	*624
Pressure .....	3000 PSI
Flow .....	3 GPM
Temperature .....	Ambient
Fluid.....	Water
Duty Cycle.....	Intermittent
Drive .....	Electric

\*Alternate CAT PUMP model 550 or 5CP3120 plunger pump.

**BENEFITS:**

- Belt life significantly increased-average 4 to 5 times.
- Belt replacement costs significantly lowered.
- Frequent cleaning offers smoother operation.



# APPLICATIONS PUMPS



## OPERATION:

All metal cuttings, oils and dirt must be removed from compressor castings before assembly. This can be a troublesome and time consuming cleaning process. Thermo King Mfg. Co. uses a specially designed machine to clean the machined holes completely and efficiently.

The single cylinder casting has 39 or 54 blind holes, and the custom built wash cabinet has 39 or 54 high pressure nozzles precisely located. The castings are placed in the cabinet on two locating pins which assure that all holes are properly aligned with the nozzles. As the door of the unit is closed, it starts a seven-second timed wash cycle. The fluid used to wash the castings is ambient water with approximately 3% rust inhibiting solution. The supply of water and inhibitor is held in the tank below the cabinet. After the wash cycle, the water is collected in a tray and runs back to the storage tank. A grill screen filters the water on its way back to the tank. The supply line to the pump is about two inches above the bottom to avoid drawing trash from the bottom of the tank. The inlet line to the pump has 200 mesh filter as a final assurance no trash gets into the pump.

There is a high pressure solenoid valve in the line connected to the timing-cycle and wired in series with a micro switch on the cabinet door. The micro switch shuts off flows to the cabinet if an operator inadvertently opens the cabinet during a wash cycle. During normal production runs, they might be running either single cylinder units or two cylinder units. A manual valve is used to direct flow to one cabinet or the other.

## CLEANING COMPRESSOR CASTINGS

File No. 166

Section 6

### PROBLEM:

Cleaning blind holes drilled and tapped in compressor castings.

### SOLUTION:

Install a high pressure cleaning system to flush metal cuttings etc. from the castings.

### SPECIFICATIONS:

CAT PUMPS Model.....	*2520
Pressure .....	425 PSI
Flow (1/3 GPM per nozzle) .....	13-18 GPM
Temperature .....	Ambient
Fluid .....	Water and Inhibitor
Duty Cycle.....	Intermittent
Drive .....	7.5 H.P. Electric Motor

\*Alternate CAT PUMP model 3520 plunger pump.

### BENEFITS:

- More efficient cleaning process.
- Requires less man hours.
- Reduces water consumption
- Eliminates potential production problems.

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# APPLICATIONS PUMPS



## SEAL GLAND FLUSHING

File No. 168

### Section 6

#### PROBLEM:

To extend the seal life in a centrifugal pump, salt water injection application.

#### SOLUTION:

Use a CAT PUMP to flush seal areas clean and improve seal life from two to three months without flushing to approximately one year with flushing.

#### SPECIFICATIONS:

CAT PUMPS Model (two) .....	*524
Pressure (each) .....	1600-2000 PSI
Flow (each) .....	3-4 GPM
Temperature .....	Ambient
Fluid.....	Water
Duty Cycle .....	Continuous
Drive .....	Electric

\*Alternate CAT PUMP model 3CP1120 or 5CP2120W.

#### BENEFITS:

- Reduces expensive downtime and operating costs.
- Greatly extends seal life.
- Small compact design conveniently fits system.
- Consistent flow and pressure to overcome the 2000 PSI centrifugal pump operating pressure.

#### OPERATION:

Some oil production sights require the disposal of hundreds of gallons of waste water. In this particular application a large can-type pump (vertical turbine multiple stage centrifugal pump) running at 350-400 GPM is required to inject the salt water back into the ground.

The oil company experienced a problem with this application which the CAT PUMP solved. The centrifugal pump had premature failure of the seal glands due to the abrasive particles in the water being trapped in the seal area. This resulted in costly repairs and downtime. To overcome this situation, they installed a CAT PUMP to flush the seal area. Since the centrifugal pump was operating near 2000 PSI, they needed a pump capable of continuous duty and overcoming the high pressure. The CAT PUMP satisfied these requirements perfectly.

The CAT PUMPS' compact size allowed it to conveniently fit right into the system. The seal glands are positioned just before the stuffing box to seal off the fluid from the shaft. Salt water and abrasive material in the pumped fluid can attack these seals quickly. The CAT PUMP is capable of injecting high pressure water into the stuffing box to flush any impurities from the seal glands and eliminate costly and troublesome failures.



This is a close-up view of the stuffing box and seal gland in a centrifugal pump. The arrow indicates the location of injection to prevent grit and abrasives from becoming embedded in the seals.

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# APPLICATIONS PUMPS



## CENTRAL CLEANING SYSTEM WORLD'S LARGEST DELI

File No. 208

Section 6

### PROBLEM:

The world's largest deli-food processing plant needed a sophisticated cleaning and sanitizing system for its 33 different locations throughout the 100,000 square foot plant.

### SOLUTION:

Install a computer controlled CAT PUMP high pressure central cleaning and sanitizing system servicing the entire plant with a series of spray guns and nozzle spray stations.

### SPECIFICATIONS:

CAT PUMPS Model.....	(three) 3531, (five) 2522
Pressure Sanitizer.....	150 PSI
Detergent.....	200 PSI
Rinse.....	450 PSI
Flow.....	Upon Demand up to 230 GPM
Temperature.....	Tepid Water
Fluid.....	Sanitizer/Detergent/Water
Duty Cycle.....	Continuous
Drive.....	Electric

### BENEFITS:

- Conserve energy over alternate 75 H.P. centrifugal system running continuously.
- Significantly reduces labor.
- Saves hundreds of gallons of water and detergent.
- Eliminates risk of product contamination.

### OPERATION:

Cleaning is in process 7 days a week, 24 hours a day at the world's largest Deli-Foods processing plant. The high pressure clean-in-place (CIP) system is an integral part of a larger highly sophisticated system designed by Dontech, Inc. to treat plant wastes and recover products and liquids for reuse. The system is versatile and capable of handling a variety of waste products such as vegetables, fruits, meats, poultry, seafood, dairy and cheese products and desserts.

The central cleaning system is required to clean, wash and sanitize equipment, process systems and work areas at 33 different locations throughout the 100,000 square foot plant. The design allows for other stations to be added to the complex as requirements dictate. Some cleaning stations require the use of spray guns which are conveniently hung from the ceiling above the work areas. Other areas make use of a series of spray nozzles. Operators can rinse, clean or sanitize their area by simply pushing a button. This button activates the central control feed system which directs the proper solution and volumes through a manifold system to the proper cleaning station. Upon completion, the station automatically shuts off.

The system is computer controlled to assure proper solution and constant volumes to each station. It is designed so each station can be individually activated but any number of cleaning stations may operate simultaneously regardless of the function being performed, e.g. rinsing, detergent or sanitizing.



Special attention was given to corrosion resistant, sanitary construction. The three 750 gallon supply tanks for rinse water, detergent and sanitizers are 316 stainless steel. All tubing is stainless steel. All hose is braided stainless steel. All control panels and valves are stainless steel. All pumps are stainless steel.

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# APPLICATIONS

## PUMPS



## HIGH PRESSURE CLEANING IN SPONGE FACTORY

File No. 213

### Section 6

#### PROBLEM:

Less than adequate cleaning job resulted in color runover and caused quality control problems.

#### SOLUTION:

New high pressure cleaning system reduced the cleaning time while doing a better job.

#### SPECIFICATIONS:

CAT PUMPS Model ..... \*310  
 Pressure .....2000 PSI  
 Flow .....4 GPM  
 Temperature .....Ambient  
 Fluid.....Water  
 Duty Cycle.....Intermittent  
 Drive .....Electric

\*Alternate CAT PUMP model 5CP2120W.

#### BENEFITS:

- Cleaning time cut by 70% enabling more production time.
- Improved quality control with more thorough cleaning and no color runover.
- Portability and simplicity makes cleaning less tedious a task.
- Water consumption cut by 90%.

#### OPERATION:

The CAT PUMP provides a significant savings for something as common as the household sponge. This manufacturer was burdened with the tedious task of cleaning vats following a production run of sponges. This cleaning had been done by hand with a garden hose and scrappers and the results were less than adequate. Many valuable working hours were required and large amounts of water were consumed.

With the installation of a CAT PUMP powered high pressure cleaning unit, they cut their water consumption by 90% and their man power by 70% and removed all traces of the previous color mix from the vat assuring better color control. The new high pressure system has greatly simplified the plant cleaning. Its portability makes it convenient to all 3 floors of operation and all types of equipment. The 10x10x8 mixing vats and mixing arms, transport carts, presses and molds can all be residue free, leaving no color runover to spoil a sponge mix. And personnel are freed for increased production.

Sponge starts out about the consistency of whipped cream and is delivered by conveyor from the mixing tanks to the agitators. The new high pressure system enables a thorough cleaning throughout the plant.



These revolving arms in the agitator are the stimulus to help create the sponge texture. All the plant equipment: conveyors, mixers, agitators, molds, transport carts etc., become coated with the sponge residue and must be thoroughly cleaned to prevent color runover from spoiling the next sponge productions run. The high pressure cleaning system does this effectively and efficiently.

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# APPLICATIONS

## PUMPS



Photo courtesy of Conco Systems, Inc.

### OPERATION:

A portable pressure washer with a specially designed tube cleaner were united for the cleaning of condenser and heat exchanger tubes. Over a period of time scale builds up and acid pockets form, causing pitting. This process, known as biofouling, increasingly reduces the efficiency of the tubes. Recommended cleaning is at least twice a year to minimize pitting.

In this application, high pressure water forces a special tube cleaner through these deposits, cleaning the inside diameter of the condenser and heat exchanger tubes. Removing the pit peaks exposes the pit and permits flushing out of the acidic deposits, retarding the pitting action. This special cleaning process increases the efficiency of the condenser, as well as the life of the tube. This high pressure method is faster and more effective in removing deposits than brushes. One four-man crew is able to clean 7,000 tubes in a single 12 hour shift.

## CONDENSER AND HEAT EXCHANGER TUBE CLEANING

File No. 218

Section 6

### PROBLEM:

To establish an effective method for the removal of biofouling in condenser and heat exchanger tubes.

### SOLUTION:

Use high pressure water to force a specially designed tube cleaner through the condenser and heat exchanger tubes.

### SPECIFICATIONS:

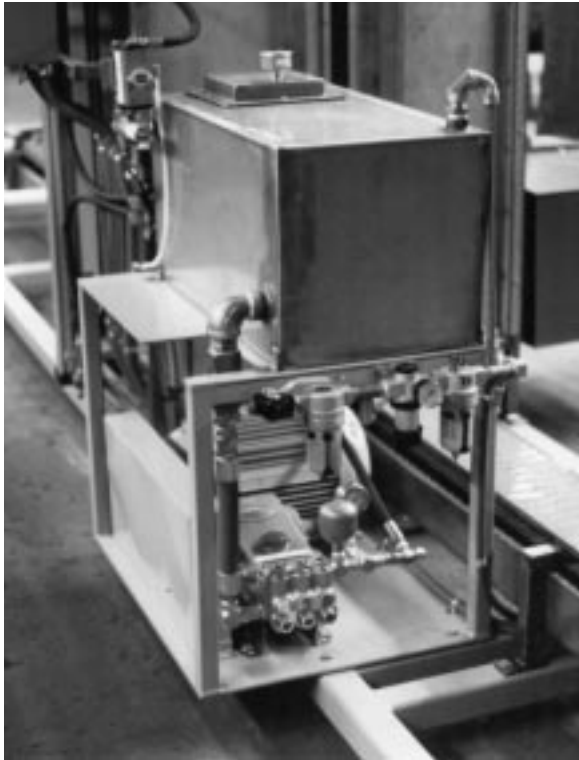
CAT PUMPS Model .....	3535
Pressure .....	200-300 PSI
Flow .....	25-35 GPM
Temperature .....	Ambient
Fluid .....	Water
Duty Cycle .....	Continuous
Drive .....	10 H.P. Electric

### BENEFITS:

- Efficient...cleans 15,000 condenser tubes within a 24 hour period.
- Extended life...maintains system cleanliness for increased tube life and condenser efficiency.
- Easy to use...portable, flexible cleaning system simplifies process.
- Safe...using low water pressure is safer than using hazardous compressed air.

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# APPLICATIONS PUMPS



Photos compliments of Air & Hydraulic Systems, Cookeville, Tennessee

## AUTOMATIC SCREEN CLEANING SYSTEM

File No. 222

Section 6

### PROBLEM:

Improve efficiency and worker safety during the cleaning of printing screens.

### SOLUTION:

Combination of high pressure, high volume water with an enclosed, pneumatic rodless cylinder to carry the spray head in a reciprocating motion, assuring fast, efficient and consistent cleaning while improving worker safety.

### SPECIFICATIONS:

CAT PUMPS Model ..... 1050  
 Pressure ..... 1800 PSI  
 Flow ..... 12 GPM  
 Temperature ..... Ambient  
 Fluid ..... Water  
 Duty Cycle ..... Intermittent  
 Drive ..... 15 H.P. Electric

### OPERATION:

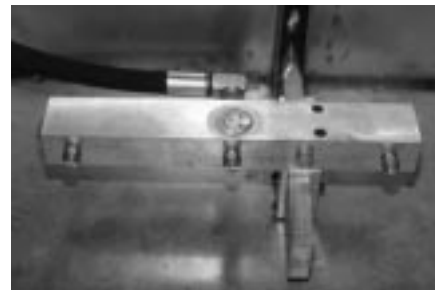
Cleaning printing screens has been an undesirable and somewhat hazardous job.

The old method applied chemicals at low pressure with two diaphragm pumps, then rinsed with high pressure clear water. This manual method was slow, unsafe and messy and resulted in poor worker moral, high employee turnover and high workman's compensation claims. Production was at capacity with only 30-40 screens cleaned in an 8 hour shift.

The new method incorporated a special pneumatic spray head, enclosed the cleaning operation and automated the process to minimize the contact the workers had with the chemicals. Worker safety was considerably improved, worker turnover was reduced and workman's compensation claims declined.

### BENEFITS:

- Improves production between 50% to 65%.
- Cleans approximately 80 screens in an 8 hour shift.
- Reduces employee accidents and turnover.
- Reduces water and chemical consumption.
- Offers greater cleaning flexibility.



A special reciprocating nozzle head provides total coverage for a variety of screen sizes.

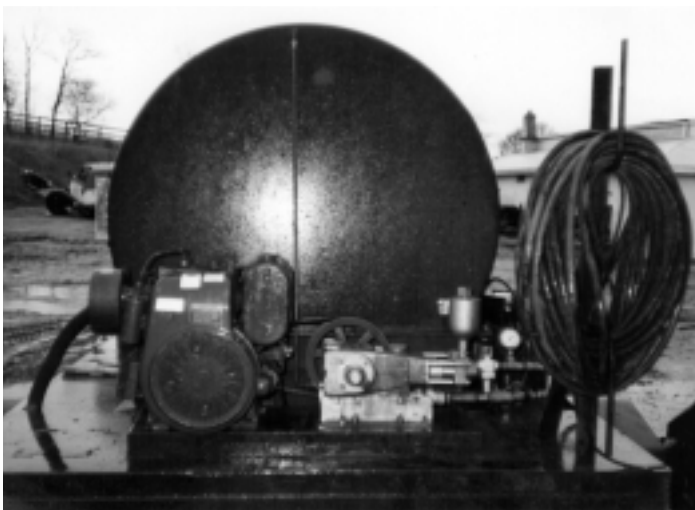
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## **Pressure Cleaning Vehicle**

- 98 Coal Mine Equipment
- 102 Locomotive Cleaning
- 131 Aircraft Engines
- 148 Cement Trucks
- 179 Gypsum Removal - Railroad Tankers

# APPLICATIONS

## PUMPS



### OPERATION:

For the past three years, the people of an Ohio mining company have been very satisfied with the dependable service and effective job provided by their truck-mounted cleaning system using a CAT PUMP. One of many services provided by this system is cleaning the radiators on their crawler tractors, drag line and front end loaders. Daily cleaning of these radiators is essential to keep them operating properly. When the radiator clogs with coal dust and restricts air flow, overheating results and ultimately contributes to shortened engine life. The system is also used to clean over 100 other major pieces of mining equipment prior to preventative maintenance and service. It is important that coal dust be removed from the equipment because it is easier to repair when the equipment is clean, and therefore results in better maintenance. This cleaning system is an integral part of the mining company's daily operation. With the CAT PUMP, the service has been dependable and they have eliminated the costly repairs they formerly experienced on previously owned cleaning equipment.

## EQUIPMENT CLEANING COAL MINING

File No. 98

Section 7

### PROBLEM:

To find a more dependable equipment cleaning system.

### SOLUTION:

Install a low maintenance, dependable, high pressure CAT PUMP model 520.

### SPECIFICATIONS:

CAT PUMPS Model ..... \*520  
 Pressure ..... 1750 PSI  
 Flow ..... 5 GPM  
 Temperature ..... Ambient  
 Fluid ..... Water  
 Duty Cycle ..... Continuous  
 Drive ..... 16 H.P. Gas Engine  
 with electric start off truck battery

\*Alternate CAT PUMP model 5CP2120W.

### BENEFITS:

- Extended engine life with daily radiator cleaning.
- Effective and convenient premainance cleaning encourages better preventative maintenance.
- Clean equipment and surroundings improve job safety.
- Reduced downtime due to cleaner equipment and preventative maintenance.
- Less expensive cleaning system operation due to maintenance free CAT PUMP.



Most mining equipment is-self cleaning, however, high pressure cleaning removes the tougher dirt and grime from the entire piece of equipment and assures the best maintenance results.



On this drag line, high pressure water removes daily accumulations of mud and/or coal dust from stairtreads, radiators etc. to allow efficient and safer operations.



On front end loaders, high pressure water cleans the running gear, reducing wear. This high pressure cleaning also extends the service life of the entire hydraulic system.

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# APPLICATIONS

## PUMPS



### OPERATION:

The Burlington Northern Railroad needed to reduce the time and cost of cleaning their locomotives prior to their regularly scheduled maintenance at the Service Pit Facility. This is a seasonal cleaning and maintenance between April and October and the locomotives cannot be tied up for long periods of time.

The new high pressure cleaning system consists of a low pressure chemical pump to apply degreasers. After a soak period, two Model 3535 pumps deliver 72 GPM of fresh water at 1200 PSI through a series of nozzles blasting the locomotive with high pressure as it passes through the cleaning tunnel to remove dirt and grime from the surface.

The previous hand cleaning method required four men and at least two hours per locomotive.

The new automated high pressure cleaning system, situated at the end of a rip track, requires only one man to monitor the operation of the system and enables at least 65 locomotives to be cleaned and serviced daily.

Maintenance on the cleaning system over a four year period included only the replacing of some nozzles.

## LOCOMOTIVE CLEANING

File No. 102

### Section 7

#### PROBLEM:

Finding an effective and efficient method of cleaning locomotives.

#### SOLUTION:

Building a cleaning tunnel equipped with an arch of spray nozzles to apply cleaning solution and blast clean with high pressure.

#### SPECIFICATIONS:

CAT PUMPS Model (two) .....	3535
Pressure .....	1200 PSI
Flow (each) .....	36 GPM
Temperature .....	Ambient
Fluid .....	Water
Duty Cycle .....	Seasonal, 24 Hr/Day
Drive (two) .....	30 H.P. Electric Motor

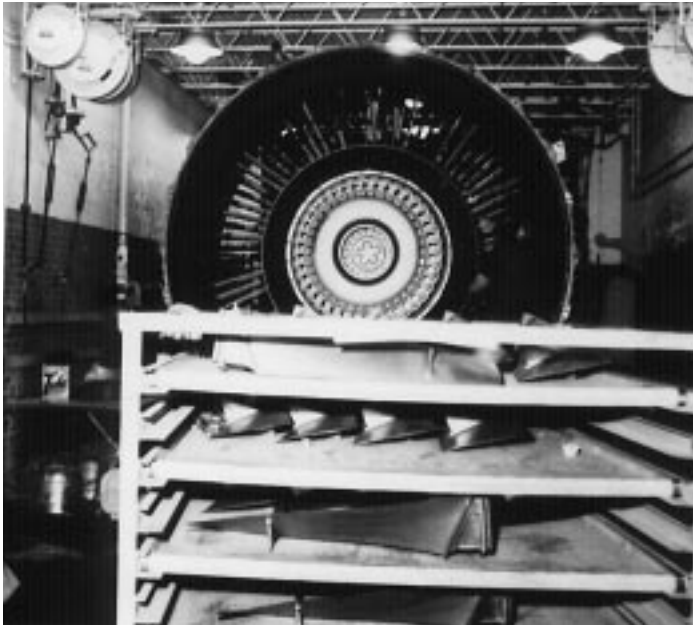
#### BENEFITS:

- Reduces manpower from 4 men to 1.
- Reduces cleaning time per locomotive from 2 hours to 15 minutes.
- Improves quality of cleaning.
- Operates with extremely low maintenance.



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# APPLICATIONS PUMPS



## OPERATION:

In 1972 American Airlines installed two model 2500 CAT PUMPS for engine cleaning at its maintenance overhaul facility. These pumps clean over 40 engines per month.

The high pressure cleaning system has provided better cleaning in much less time than the old conveyor and dip method. The high pressure cleaning has reduced expenses by eliminating some of the special cleaning solutions and time necessary for soaking in these solutions. It has also saved money because of its dependable, low-maintenance operation.

The average engine requires a complete overhaul every 12,000 hours. This overhaul is a very complicated process and every part of the engine is given a thorough evaluation and rebuilding. Considering the average engine initially costs \$2.2 million dollars, the best in maintenance is essential. A good overhaul depends upon a thorough cleaning.

727, 747 and DC 10 engines are cleaned at this facility. Each engine is completely disassembled and may go through several cleaning processes in preparation for overhaul. These engines run on kerosene fuel. A soap solution and high pressure are used to remove the carbon build up from the kerosene fuel. In some cases of

## CLEANING AIRCRAFT ENGINES

File No. 131

Section 7

### PROBLEM:

Cleaning aircraft engines before repairing or rebuilding.

### SOLUTION:

Install a high pressure wash bay.

### SPECIFICATIONS:

CAT PUMPS Model (two) .....	*2500
Pressure .....	700 PSI
Flow (each) .....	22 GPM
Temperature .....	Ambient
Fluid .....	Soap solution wash and water rinse
Duty Cycle.....	Intermittent
Drive .....	Electric

\*Alternate CAT PUMP models 2520 and 3520.

### BENEFITS:

- Saves time and trouble when servicing engines.
- Easy, effective cleaning accomplished in 45 minutes.
- Pump provides dependable, low-maintenance cleaning operation.

unusually severe carbon buildup, a hot alkaline soak is also necessary.

Silicon is used as a sealant during assembly of engines. When the engine is disassembled for overhaul, the old silicon must be removed from the engine parts. High pressure cleaning is used along with a silicone stripper solution and soak.

On special carts, the engine parts are wheeled into a 300 x 600 foot cleaning bay. Four guns, each delivering 11 GPM at 700 PSI, apply the soap solution and rinse to the engine parts. A thorough cleaning before overhaul can be completed in just 45 minutes.

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# APPLICATIONS

## PUMPS



### OPERATION:

Bulk cement and readymix concrete trucks require regular cleaning. Bulk trucks haul dry cement to the wholesaler for bagging or to the readymix supplier. When dry cement is loaded into the bulk trucks, spillage occurs. Any rain or humidity causes the cement to harden and form a concrete scale which is difficult to remove. Without a convenient and effective cleaning system, this clean-up is often neglected unit it seriously effects the loading.

A trailer mounted, diesel powered model 6024 CAT PUMP cleans the readymix trucks following daily concrete deliveries and removes the concrete scale around the loading hatch of trucks carrying bulk cement.

Readymix trucks face a similar problem of clean-up. Most trucks carry a small portable water source and standard garden hose to wash down the chute after delivering a load of concrete. However, when the trucks are returned to the yard at the end of the day, a thorough cleaning of the entire truck must be done. Cement inside the drum must be removed to prevent build-up and potential malfunction of the equipment. The entire exterior of the truck must be blasted clean also. Each time the truck is loaded with concrete, a certain amount of spillage occurs. By the end of the day, after several hauls, the sun and weather have baked the concrete onto the truck and removal becomes increasingly difficult.

Concrete that has set for less than 24 hours can usually be removed with 5 to 6 GPM and approximately 1200 PSI. However, weather conditions will also alter the set-up for concrete and may require greater pressures for clean-up. Concrete after 30 days needs 12 GPM, 5000 PSI and sandblasting. A wet sandblasting unit is easily adapted to this system.

## CEMENT TRUCK CLEANING

File No. 148

### Section 7

#### PROBLEM:

To keep the loading hatch of trucks carry bulk cement clean. To clean mixed cement from readymix trucks.

#### SOLUTION:

Develop a high pressure blaster/cleaner using a CAT PUMP model 6024.

#### SPECIFICATIONS:

CAT PUMPS Model .....	*6024
Pressure .....	Up to 5000 PSI
Flow .....	Up to 12 GPM
Temperature .....	Ambient
Fluid .....	Water/Sand Injection
Duty Cycle.....	Intermittent
Drive .....	50 H.P. Diesel Engine

\*Alternate CAT PUMP model 6811 or 3801 block-style plunger pumps.

#### BENEFITS:

- Portability.
- More frequent and thorough clean-up.
- Clean hatch makes smoother bulk cement loading.
- Versatility from daily cleaning to sandblasting needs.
- Longer lasting equipment as a result of better maintenance.
- Removal of cement weight for increased fuel economy for trucks.



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**OPERATION:**

Gypsum is a by-product of phosphate which is used as fertilizer. This gypsum must be hauled from the phosphate field for further processing into wallboard, etc. The railroad cars used for hauling the gypsum are rubber lined for corrosion resistance. After a short period of time, the gypsum builds up on the inside of the tankers and must be removed because of the increasing weight added to the train. Sandblasting was formerly used to remove the gypsum, but because it left a mess and often removed a great deal of the rubber coating on the inside of the tanks, a better method was selected. Now a CAT PUMP high pressure sprayer is used. The spray works its way under the edge of the thick gypsum build-up and blasts it free. The pressure and flow varies depending upon the thickness of the gypsum build-up. The new pressure sprayer is also used to clean the dirty exterior of the tankers, because the identification markings must be visible. With the old sandblasting method, many of the markings were removed along with the dirt and these were time consuming and expensive to redo.

**GYPSUM REMOVAL  
RAILROAD TANKERS**

**File No. 179**

**Section 7**

**PROBLEM:**

To find an efficient means of removing the gypsum build-up from inside railroad tank cars.

**SOLUTION:**

Use a high pressure portable water blaster.

**SPECIFICATIONS:**

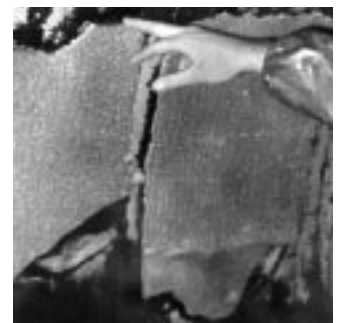
CAT PUMPS Model .....	*1044
Pressure .....	2000 PSI
Flow .....	10 GPM
Temperature .....	Ambient
Fluid.....	Water
Duty Cycle.....	Intermittent
Drive .....	15 H.P. Electric

\*Alternate CAT PUMP model 1050.

**BENEFITS:**

- Eliminated messy clean-up with sand and saves time as the water dries quickly.
- More pleasant function as the tanker remains cooler inside with pressure cleaning.
- Exterior clean-up done quickly and without damage to surface or tanker markings.

After spraying, the gypsum begins to erode and the spray gets under the edge and blasts large sections free from the rubber wall.



## Reverse Osmosis

- 02 Reverse Osmosis Desalination
- 62 Offshore or Island R.O. Systems
- 108 Portable R.O. Systems
- 109 Water Desalination



## REVERSE OSMOSIS - DESALINATION

Lanzarote Volcanic Island Tourist Complex

File No. 02, Section 8



### OPERATION:

In the world of RO-desalination, the Canary Islands are known as the largest RO-laboratory on earth. It is believed that any RO-equipment that can cope with chemically treacherous Canary waters, can be operated anywhere in the world. In RO-desalination, the high-pressure pump is an essential component and must be designed to handle these treacherous conditions.

In 1985, Borje Johanssen, a Swedish Engineer, built an 800 m<sup>3</sup>/d SW/RO-plant for a tourist complex on the volcanic island of Lanzarote. It consisted of four trains of 6-inch spiral wound membranes, each one fed by two positive displacement pumps. Johanssen opted for CAT PUMPS as his company had over 10 years of experience with these difficult waters and the CAT PUMPS were widely used over the Archipelago.

With a conversion rate of 33% and an operating pressure of 64 bar (940 PSI), the power consumption of the modules in 1985 was over 6.7 kW-h/m<sup>3</sup>, well pump included.

### PROBLEM:

Expand the capacity of a ten-year-old CAT PUMP RO System.

### SOLUTION:

Install a new 150FR CAT PUMP large capacity system.

### SPECIFICATIONS:

CAT PUMPS Model .....	SSD 152R080
Pressure.....	800-1000 PSI
Flow .....	125 GPM
Temperature .....	Ambient
Fluid.....	38,000 TDS Seawater
Duty Cycle .....	Continuous
Drive.....	100 H.P. Electric

### BENEFITS:

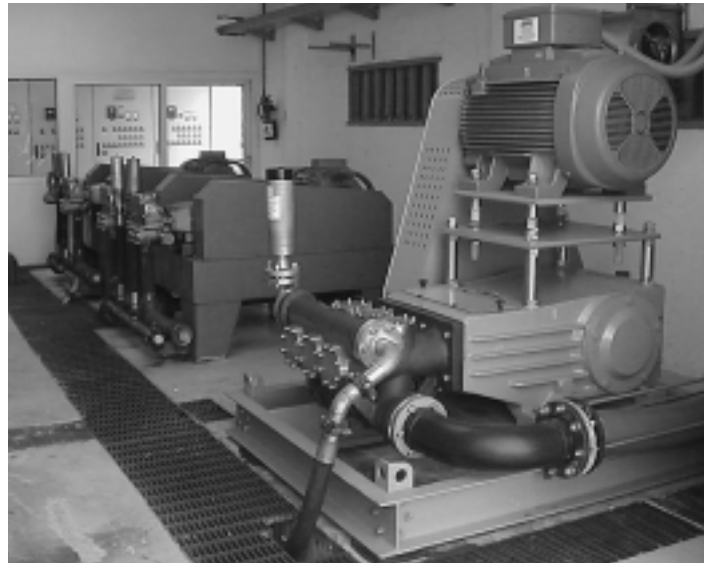
- System capacity doubled with a single pump installation.
- Low amp draw offering a 62% energy savings.
- 35% conversion rate to fresh water.
- Durable Duplex Stainless Liquid-end.

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Seven years later, in 1992, each of the eight NAB CAT PUMP Model 6767 pumps showed over 50,000 hours and it was decided the plant would be retrofitted by the DPG-Company. At this time eight new 316 Stainless Steel CAT PUMPS Model 6761 pumps were installed and 8-inch membranes replaced the previous 6-inch membranes. Without any difficulty, turbo-chargers were synchronized with the CAT PUMP units, increasing each module capacity up to 250 m3/d and reducing energy consumption down to less than 5.0 kW-h/m3 permeate. In 1992, this was an excellent result.

Ten years later, in 2002, all eight 316 Stainless Steel CAT PUMPS show over 70,000 hours of continuous running and still in good operating condition. The plant owner entrusted the DPG-company once more to retrofit and to expand the plant's capacity. As a starter, DPG decided to replace one 250 m3/d CAT PUMP module with a single unit containing the new Duplex Stainless Steel CAT PUMP Model 152R080. This is coupled to a Pressure Exchanger-energy recovery system.

The results are overwhelming. Production went up to 510 m3/d per module at a new 35% conversion rate and because the pump hardly draws 78 amps, energy saving is over 62% compared to the previous system. Energy consumption now is merely 2.64 kW-h/m3, beach well pumps included. Moreover, product quality has improved to less than 250 ppm. In addition, pump maintenance is even less with the single pump.



CAT PUMPS Power Units [Background 60 FRAME, Front 150 FRAME]

Although, the remaining three 316 Stainless Steel CAT PUMP Model 6761 units are still operational, the end-user has been so impressed by the new 150 Frame results that another two CAT PUMP Model 152R080 units are already in-place and ready to take over from the 10-year old Model 6761 pumps. These older units will be used as stand-by units or in case of supplementary water demand.

Altogether, the CAT PUMPS have successfully produced potable water from the 38,000 TDS seawater during more than 1,000,000 hours of operation.

The Pumps with Nine Lives.

Products described hereon are covered by one or more of the following U.S. patents 3558244, 3652188, 3809508, 3920356, 3930756 and 5035580

Apr 2002 32107

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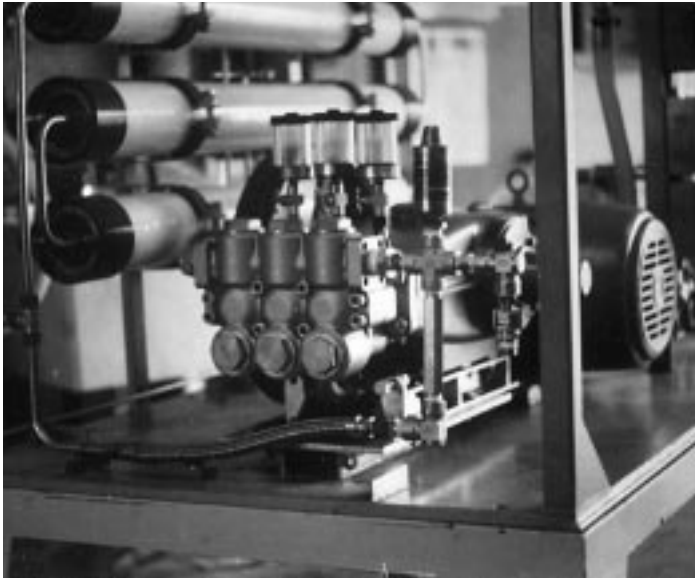
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# APPLICATIONS PUMPS



## OFFSHORE OR ISLAND SUPPORT REVERSE OSMOSIS SYSTEMS

File No. 62

Section 8

### PROBLEM:

Offshore oil rigs, large ocean vessels and remote islands need economical system to convert seawater to fresh drinking water.

### SOLUTION:

A Reverse Osmosis system with a CAT PUMP providing a consistent, pressurized flow to a special membrane results in a processed, purified water. This system eliminates the need to store quantities of water, requires limited energy and delivers a consistent quantity of pure water upon demand.

### OPERATION:

The stainless steel model 3521 plunger pump provides a smooth quiet continuous fluid delivery in offshore reverse osmosis (RO) installations.

RO has become an integral part of offshore drilling providing fresh water for a variety of platform and equipment cleaning and maintenance functions. RO has eliminated the need to store large quantities of fresh water. With the increased availability of fresh water, better and more frequent cleaning is performed, thereby increasing worker safety and reducing equipment failure and costly downtime. RO provides fresh water used in cooling to keep equipment running efficiently. In addition to these advantages, RO requires less space and energy than other filtration processes such as distillation.

### SPECIFICATIONS:

CAT PUMPS Model.....	*3521
Pressure.....	800 PSI
Flow.....	12-23 GPM
Temperature.....	Ambient
Fluid.....	Salt Water
Duty Cycle.....	Continuous
Drive.....	10 H.P. Electric

\*For single or multiple pump systems alternate CAT PUMP models 3831 or 6861.

### BENEFITS:

- Continuous duty operation and simple periodic maintenance.
- Corrosion resistant pump construction of 316 Stainless Steel.
- Compact and lightweight for portability and space savings.
- Energy efficient substantially reducing operating costs over other methods such as distillation.
- No heat process eliminates expensive cooling of processed water.

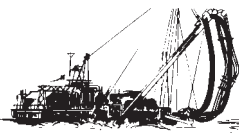
### Typical Offshore Applications for Reverse Osmosis



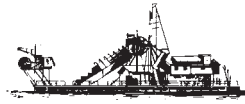
Offshore Drill Rigs



Commercial Fishing Boats



Pipe Laying Barges



Oil Well Dredges



Tankers – Cargo Ships

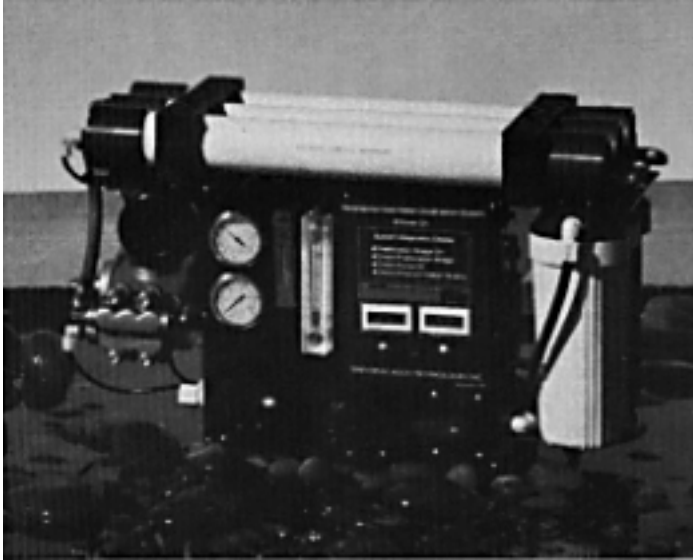


Island Support

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# APPLICATIONS PUMPS



## PORTABLE REVERSE OSMOSIS SYSTEMS

File No. 108

### Section 8

#### PROBLEM:

Providing fresh water aboard any size water craft having space limitations.

#### SOLUTION:

Building a lightweight, direct drive R.O. unit offering continuous duty performance.

#### OPERATION:

This watermaker manufacturer incorporated the advanced features of its larger capacity R.O. systems into an ultra compact direct drive unit for sailboats, small pleasure craft, yachts and commercial fishing boats.

These small R.O. systems are direct drive and fit into the smallest hulls and yet are totally accessible for periodic maintenance.

These systems deliver 200 to 2000 gallons of fresh water per day and are equipped with a digital diagnostic display to monitor the performance at a glance.

#### SPECIFICATIONS:

CAT PUMPS Model.....	*231 or 241
Pressure .....	1000 PSI
Flow .....	2.3 or 3.6 GPM
Water Output.....	200 to 1600 GPD
Temperature.....	40-90°F
Fluid .....	Seawater
Duty Cycle .....	Intermittent/Continuous
Drive .....	1.5 to 3.0 H.P. Electric

\*Alternate CAT PUMP model 3CP1121, 3CP1131 or 3CP1141.

#### BENEFITS:

- Ultra compact unit.
- Special alloys offer dependable service and compatibility.
- Flexible drive and pump options to meet output.
- Extremely accessible design simplifies periodic maintenance.

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# APPLICATIONS PUMPS



## REVERSE OSMOSIS WATER DESALINATION

File No. 109

### Section 8

#### PROBLEM:

To find a more feasible method to remove salts from water.

#### SOLUTION:

Install a high pressure CAT PUMP in a reverse osmosis system.

#### OPERATION:

As an alternative to the conventional distillation method (boiling water to remove salts and collecting the condensate), reverse osmosis pressurizes the salt water, forcing it through membranes which cause the salt ions to break away from the water molecules and expel clear water. Reverse osmosis provides a lightweight, convenient system to supply potable water aboard ships or yachts, for communities or many industrial needs.

The significance of reverse osmosis over other methods for separation problems is a low energy requirement. The only energy needed is the pressure to force the fluid through the semi-permeable membrane. This is provided by a high pressure pump driven by electric motor or gas engine.

In this system the CAT PUMP circulates the water twice, leaving extremely pure water (40 PPM) which is ideal potable water aboard yachts and ships. (The World Health Organization and the U.S. Public Health Department recommend 500 PPM total dissolved salts as a standard for drinking water).

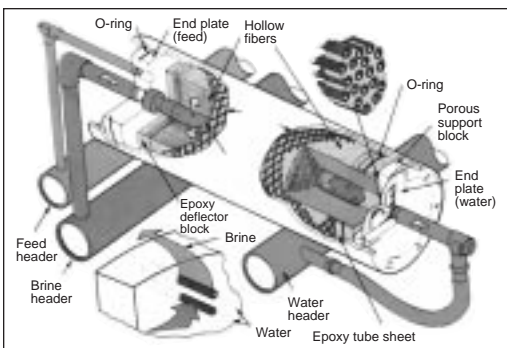
#### SPECIFICATIONS:

CAT PUMPS Model .....	*826
Pressure .....	1000 PSI
Flow .....	3 GPM
Temperature .....	Ambient
Fluid .....	Salt Water
Duty Cycle .....	Continuous
Drive .....	3 H.P. Electric

\*Alternate CAT PUMP model 3CP1121, 3CP1141 or 5CP6121.

#### BENEFITS:

- Significant weight and savings over distillation method permits placement anywhere aboard ship.
- Easy, simple operation greatly reduces mechanical downtime.
- Energy efficient reverse osmosis requires only 30% of the energy required to boil the water in distillation.
- Convenient installation eliminates any connection to the ship's motor or propulsion system or proximity to the boiler.
- Reverse osmosis provides fresh water at 1°C above the temperature of the salt water entering system which eliminates the cooling necessary in distillation.



Typical  
membrane

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## Spraying/Misting/Cooling

- 31 Waste Water Odor Control
- 36 Humidity Control
- 99 Fire Protection
- 124 Mist Cooling  
Temperature Control System
- 183 Coal Dust Suppression

# APPLICATIONS

## PUMPS



*Photos courtesy of NuTech Environmental, Denver, Colorado*

### OPERATION:

Many methods have been used to control industrial waste odors, but none so effective and easy to use as this CAT PUMP powered high pressure fogging concept.

Current methods include masking which simply covers one odor with another and often make the combination worse than the original; oxidation which is effective, but requires expensive scrubbing equipment and considerable reaction time; carbon absorption which also requires costly equipment and maintenance, plus the difficult disposal of hazardous wasted carbon.

NuTech's new Vapor Phase Technology offers an effective and affordable alternative to these conventional methods of odor control. NuTech uses the published neutralization techniques listed in the Water Pollution Control Federation.

Manual of Practice #22, specifically the techniques of construction, combining and interference. They have developed specially formulated compounds to work with a high pressure fogging system to economically and effectively neutralize industrial waste odors.

This system is extremely flexible to accommodate the individual location and odor control needs. Each system includes a high pressure, triple filter, patented anti-drip swivel nozzles and specially sized and fitted hose to meet the specific dimensions of each installation.

## WASTE WATER ODOR CONTROL

File No. 31

Section 9

### PROBLEM:

Traditional methods for odor control require large capital expenditures for equipment with significant operating costs and often, poor overall effectiveness.

### SOLUTION:

Offer a unique high pressure fogging system using environmentally safe neutralizing agents to convert offensive industrial waste odors into odorless solubles with minimal costs and maximum efficiency.

### SPECIFICATIONS: (depends on size of site)

CAT PUMPS Model .....2SF20E or 1051  
 Pressure .....800 PSI/1000 PSI  
 Flow ..... 2 GPM/10 GPM  
 Temperature ..... Ambient  
 Fluid ..... Water and Chemical Formula  
 Duty Cycle ..... Continuous  
 Drive ..... 2 H.P. or 15 H.P. Electric

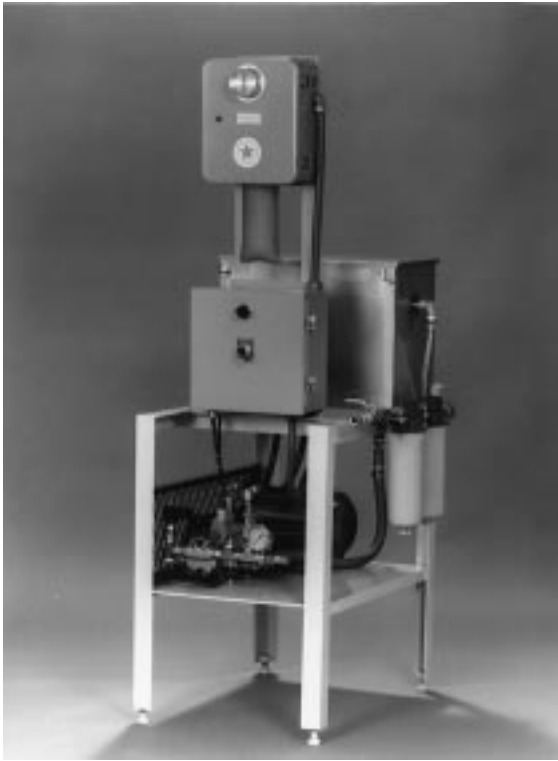
### BENEFITS:

- Reduces capital expenditures.
- Lowers chemical and operating costs.
- Proven fast, broad range effectiveness.
- Easy installation and operation.
- No hazardous waste.



10 micron fog droplets are delivered around the perimeter of the site. Only natural neutralizing agents are used, which will not harm the environment, even if misused.

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## HUMIDITY CONTROL SYSTEM

File No. 36

Section 9

### OPERATION:

Humidity control is very important in a number of industries. Stabilizing moisture in wood products prevents warping, joint separation and shrinkage while reducing dust in the working environment. In the textile industry, humidity controls static electricity and increases tensile strength of the natural fibers. In the printing industry it decreases curl and provides evaporative cooling.

The system designed by American Moistening Company electronically measures the humidity level and either initiates operation if below or terminates operation if above the set point. When activated, the CAT PUMP Model 270 delivers high pressure water through a 3/8" line to special atomizer nozzles. This micro mist is quickly absorbed into the atmosphere until the set humidity level is achieved.

The system has dual filters to prevent dirt, rust and scale from clogging the nozzles and a baffled water reservoir to prevent turbulent water from entering the pump. The system also has a low water and low pressure cut off. All these features assure a low maintenance system.

### PROBLEM:

To find an effective method of controlling humidity in various businesses to reduce static electricity or control moisture levels.

### SOLUTION:

Develop a micro misting system which responds automatically to changing atmospheric conditions.

### SPECIFICATIONS:

CAT PUMPS Model .....	270
Pressure .....	1500 PSI
Flow .....	3.5 GPM
Temperature .....	Ambient
Fluid.....	Water
Duty Cycle.....	Continuous/Intermittent
Drive .....	5 H.P. Electric

### BENEFITS:

- Controls plant humidity within  $\pm 3\%$ .
- Uses pressurized water, no compressed air.
- Produces micro mist which is quickly absorbed into the atmosphere.
- Economical, low maintenance operation.

# APPLICATIONS

## PUMPS



## FIRE PROTECTION AND CLEAN-UP SYSTEM

File No. 99

Section 9

### PROBLEM:

To provide a fail-safe, effective fire protection system and reduce fire danger by keeping compressor area clear of hazardous oil and grease deposits.

### SOLUTION:

Installation of a constant full pressure fire protection header which would immediately flood entire compressor station as a result of a rise in temperature or a drop in pressure in the system. Also would provide a central high pressure cleaning system.

### OPERATION:

The six large engine compressors at this location are used to pressurize natural gas as it is drawn from the ground to dehydrate, as well as provide a means of propelling it to its destination. With a large volume of compressed gas in proximity, the concern for fire and explosion is critical.

At this White Castle, LA plant, the CAT PUMP is used to maintain continuous pressure on the fire protection system. Pressure switches in the system start the pump anytime the pressure drops below 850 PSI. Some twenty-five 180°F fuse plugs are installed at predetermined probable hazard locations on the INGERSOLL-RAND SVG engine compressor. Any open fuse immediately shuts down the compressor engine and opens the valve on the protection system, flooding the engine area.

All six engine compressor areas can be protected with this one pump by running piping to the other locations.

The installation also does "double duty" by providing a high pressure cleaning system with six clean-up stations.

### SPECIFICATIONS:

CAT PUMPS Model .....	6020
Pressure .....	1000 PSI
Flow .....	60 GPM
Temperature .....	Ambient
Fluid.....	Water
Duty Cycle.....	Continuous as needed
Drive .....	50 H.P. explosion proof electric

### BENEFITS:

- Lower insurance rates.
- A positive, 100% fail-safe fire protection system.
- Most effective system under adverse conditions.
- Also provides a multiple station central cleaning system, resulting in a safer plant.

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# APPLICATIONS PUMPS



## MIST COOLING TEMPERATURE CONTROL SYSTEM

File No. 124

### Section 9

#### PROBLEM:

To find a more efficient and effective poultry cooling system.

#### SOLUTION:

Install a high pressure fogging system.

#### SPECIFICATIONS:

CAT PUMPS Model .....	*430	*1010
Pressure .....	600 PSI	600 PSI
Flow .....	5 GPM	12 GPM
Temperature .....	Ambient	Ambient
Fluid .....	Water	Water
	(scale remover)	(scale remover)
Duty Cycle.....	Continuous	Continuous
	during season	during season
Drive.....	2 H.P. Electric	5 H.P. Electric

*\*Every system is specialized depending upon type of poultry, temperatures and size and type of facility.*

#### BENEFITS:

- Reduces bird loss from thousands to almost NONE.
- Extends breeding period of poultry.
- Also functions as a dust suppressor.
- Increases egg production and egg size.
- Reduces water and energy consumption.
- Results in cleaner, drier surroundings.
- Reduces evaporation pad cleaning or replacement and labor costs involved.

#### OPERATION:

Traditional methods of preventing poultry from collapsing due to heat stress are rooftop sprinklers, water sprayed directly on birds and evaporation pads. These methods often consume considerable water, have inconsistent temperature control or result in water saturated birds causing pneumonia and death. Consistent control of excessive heat is a major concern of the poultry farmer as temperatures above 90°F slow down egg production, reduce egg size and can result in the death of thousands of birds.

Poultry specialists have developed misting systems using a new procedure in evaporation cooling, that has proved remarkably successful and results in immediate and consistent cooling.

These misting systems create a artificial fog by pumping water through specially designed nozzles at 300 to 500 PSI. The fog surrounds the birds keeping them evenly cooled without saturation much like an air conditioner but far less costly to operate.

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# APPLICATIONS PUMPS



## CONTINUOUS MINER COAL DUST SUPPRESSION

File No. 183

Section 9

### OPERATION:

Coal mining is a very demanding, dirty and dangerous job. With the installation of a high pressure spray system, some of these adversities have been minimized. A continuous miner has a series of rotating cutting blades. Between each blade a nozzle is mounted. As the blades carve out the coal and the coal falls onto the conveyor, a spray is emitted to settle the coal dust and help flush the coal cuttings onto the conveyor.

The unit is mounted outside the mine area for safety and to eliminate the added expense of an explosion proof motor. This skid mounted unit is also used for equipment clean-up which reduces downtime and maintenance expense.

Under standard laboratory conditions, 5% dust concentrate is considered effective control. With the 3000 PSI high pressure water dust suppression system, the dust concentrate is reduced to an impressive 1%.

### PROBLEM:

To eliminate the hazards of coal dust while mining.

### SOLUTION:

Install a high pressure spray system for dust suppression.

### SPECIFICATIONS:

CAT PUMPS Model .....	*2520
Pressure .....	700-800 PSI
Flow .....	25 GPM
Temperature .....	Ambient
Fluid .....	Water
Duty Cycle .....	Continuous
Drive .....	Electric

\*Alternate CAT PUMP model 2530 plunger pump

### BENEFITS:

- Reduces air pollution and improves working conditions for the coal miner.
- Improves the performance of the mining equipment.
- Eliminates fire hazard associated with accumulated coal dust.
- Reduces equipment downtime and maintenance costs.

*“Customer confidence is our greatest asset”*



Products described hereon are covered by one or more of the following U.S. patents 3558244, 3652188, 3809508, 3920356, 3930756 and 5035580

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*The Pump with "Nine Lives"*

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