



Serving the Pacific Northwest

# PumpTech Pipeline

Providing Knowledgeable Solutions

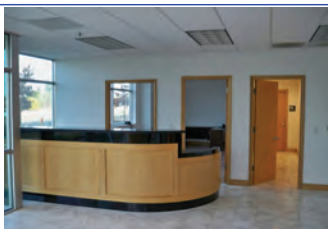
## PumpTech Portland Moving to New Facility in Canby

In addition to the remembrance of Pearl Harbor Day, another important

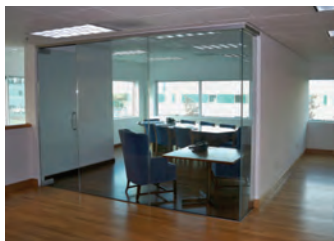


event occurred on December 7th. PumpTech completed the purchase of its new facility in Canby Oregon. Both limited office space and the manufacturing of our Hydronix and Meterman packaged stations have taxed the existing facility for several years. If all goes as planned we will get the additional space we need in mid February.

The new facility, located at 321 S Sequoia Parkway, will more



than double the area of our existing building. The two floor, office complex is about 5400 sq feet and includes a formal reception area and conference room. This area will be home to sales & sales support, engineering, [Continues on page 2](#)



## ABS Introduces The World's First Premium Efficiency Submersible Motors!

ABS Pumps (Meriden CT) has introduced the world's first line of submersible sewage pumps driven by Premium Efficiency electric motors. The new EffeX line meets or exceeds the European Union, IE-3 efficiency requirement which parallels the NEMA Premium Efficiency standards used in the US. All EffeX motors were designed and tested in accordance with IEC60034-30 and qualify for US energy incentive programs. EffeX pumps are designed for wet or dry pit installation and all

come standard with a FM Explosion Proof rating. All have Class H insulation and operate with a Class A (wet pit) or Class B (dry pit) temperature rise. But wait, there is a lot more than just increased motor efficiency. [Continues on page 2](#)



### PumpTech, Inc.

Bellevue, WA  
12020 SE 32nd St #2  
Bellevue, WA 98005  
888-644-6686

Portland, OR  
2425 SE Ochoco St  
Portland, OR 97222  
503-659-6230

Moses Lake, WA  
209 S Hamilton Rd  
Moses Lake WA 98837  
509-766-6330

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### PumpTech Canby Facility continues here



purchasing, and management. The entrance to the office complex is shown on the left.

The manufacturing and shop area has a footprint of 10,000 sq

feet and 20 feet of head room. It will be outfitted with two bridge cranes with a total capacity of 5 tons. Both will run along the same rail which will allow lifting of large basins and skids.



There are double overhead doors on both sides of the building. One side provides high overhead, access to the shop and manufacturing area and the other is a truck loading / unloading dock.



The buildings power supply is 480 volts (200 amps) and will be capable of supplying 460/230 V three phase and 230/115 V single phase. This will allow testing of a wide range

of motors and pumps.

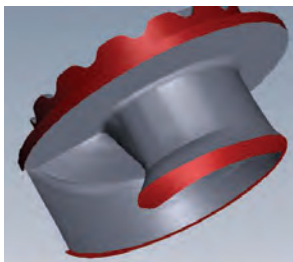
In addition, a 3000 sq foot mezzanine (shown to the right) will serve as a warehouse and provide ample storage for pumps, motors, parts and accessories.



PumpTech started looking for a new facility three years ago. We looked at many possibilities but the Canby building provided everything we wanted. It has plenty of space for growth and it is in "brand new" condition. Please plan to drop by for a visit in early March.

### ABS EffeX Series continues here

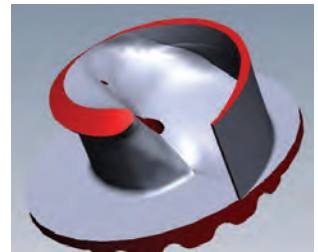
In addition to Premium Efficiency motors the proven (and often copied) Contrablock impeller has been completely redesigned. The new Contrablock Plus design enhances clog resistance while maintaining a minimum 3" spherical solids passage. The new design also increases the hydraulic efficiency of most pump models.



The SolidWorks image on the left illustrates two of the new impeller features. The curved lip at the leading edge of the vane guides rags and other material into the flow path and prevents potential build up at the vane entry. The redesigned pump out vanes on the back side of the upper shroud prohibit the entrance of stringy material into the mechanical seal area.

The image on the right shows the inside of the

impeller eye. The sloped interior surface resists build up of solids and ragging in the eye by directing them towards the vane entrance. In addition to an improved impeller design, the bottom wear plate can be adjusted without disassembling the pump. This adjustment provides the optimum clearance between the impeller and wear plate and maintains maximum hydraulic efficiency over the life of the pump.



Another great feature is the new FM approved, power cable plug (shown on Page 1). It allows cable removal and replacement on site. It also allows you to remove a pump without having to pull the cable out of the conduit.

For more information contact your local PumpTech office or visit [www.ABSEffeX.com](http://www.ABSEffeX.com).

## Featured Project: Snoqualmie Casino Packaged Pump Houses



The Snoqualmie Casino project originally called for a well pump, fire pump, booster skid, irrigation pump and all of the associated controls installed in buildings constructed by a subcontractor. Jack Boyd (PumpTech Bellevue) argued the benefits offered by factory-built, turn-key stations versus building-in-place.

Working closely with RH2 Engineers and SKANSKA Construction, Jack presented an alternative proposal consisting of four prefabricated buildings with preinstalled pump systems and controls. The package met the requirements of the RH2 design and relieved SKANSKA of the need to coordinate construction of the buildings and installation of piping, pumps, a treatment system, controls and wiring. Even though the odds always favor the casino, they decided not to gamble on this one and accepted Jack’s proposal in its entirety.



Blazer Industries (Oregon) supplied PumpTech with prefabricated buildings built to both IBC standards and the architectural appearance required by the customer. During construction at the Blazer facility the piping and wiring was also installed. Once complete, PumpTech installed the prepackaged pump systems and controls prior to

delivery. Upon delivery, the building was placed on a perimeter strip footing, the piping & power was connected, and it was ready to go. The picture below shows the fire pump house. It houses a 2600gpm UL/FM fire pump package, a jockey pump, and the controls.



The larger building at the bottom of the left hand column houses the central control system, domestic pressure booster, and an iron manganese treatment system. The smaller building, across the street,



houses the irrigation pump package. The well pump house is not shown. The pictures above and to the left are shots of the interior of the main building.



The Snoqualmie project did have its challenges. Its overall scope, a demanding construction schedule, and the pressure to insure a flawless grand opening of the casino made this a “high stakes” game. In the end, all parties “hit the proverbial jackpot”.

If you are interested in seeing what Snoqualmie Casino has to offer, click on the link below.

<http://snocasino.com/>

## Meet the PumpTech Engineering Team

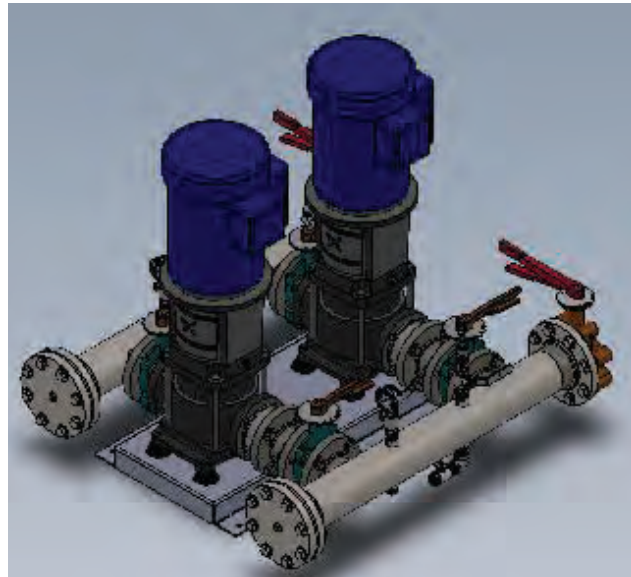
A number of our customers probably do not know that PumpTech has its own engineering department. Andy Baker, ME, PE (standing) and Musse' OloI, ME, EIT do the system design for our UL listed, Hydronix and Meterman products. They also assist the consulting engineering community



with specific projects. Andy is certified in both Washington and Oregon. Prior to joining PumpTech, he worked for the Department of Health and Human Services (OR) and was involved with the Oregon Drinking Water Program. Musse' came to PumpTech from Advanced Engineering, PC where he was a consultant on the Combined Sewer Overflow (CSO) project for the city of Portland.

Andy and Musse' use SolidWorks, the state of the

art three dimensional drafting tool, for all of our design work. The simple booster system and each of its components shown below can be viewed in detail from all directions by rotating the image in SolidWorks.



If your company does not have access to SolidWorks, engineering can provide you with AutoCad compatible drawings. There is also a free viewer (eDrawing) that allows complete views and mark up of existing SolidWorks drawings.

If you have questions, feel free to contact Andy or Musse' at [Inquiries@pumptechnw.com](mailto:Inquiries@pumptechnw.com).

## Education & Training—Offerings

PumpTech has developed over twenty different seminars for water, wastewater and industrial pump users and all have been approved for CEU credits in Washington and Oregon. These seminars are presented free of charge at work shops & conferences and at a nominal charge (travel expenses) at your own location. Topics include basic hydraulics, ac power & motors, variable frequency operation, NPSH, pump & motor efficiency, the pump selection process, and many others. Most can be mixed and matched for a half or even a full day of training.

If you are interested in a presentation at your location, please contact your nearest PumpTech

branch office and ask for a training brochure and the seminar abstracts. You may also contact Joe Evans (Customer Education and Training) directly at 503-310-9997 or you can drop him an email at the address below.



**Ask PumpTech** - If you have a product or technical question, email it to Joe and he will either answer it or send it on to the person who can.

[jevans@pumptechnw.com](mailto:jevans@pumptechnw.com)

### Bellevue Office Expansion

Although not as cramped as the Portland office, our corporate headquarters in Bellevue has also experienced growth pains. As PumpTech grows, so does the accounting, IT, personnel, sales, and shop staff.



The Bellevue office is just a little over six years old but its original 2900 sq feet was totally consumed.

Last fall began construction on an additional 1800 sq ft mezzanine over the rear of the shop area. It was ready for occupancy in December. The 10



cubicals seen here are now home to the outside sales and shop staff. Accounting, IT, personnel, inside sales and management remain in the original office area but with lots more room. The shop maintains its original foot print of 6000 sq ft.

### Packaged Pumping Systems By PumpTech Inc.

In 2002 PumpTech acquired Hydronix, a Portland based company that has been manufacturing packaged pumping systems for more than 40 years. With over 2800 municipal, commercial & industrial installations through out the US, Hydronix remains a major player in the packaged systems market.



PumpTech designs and manufactures a wide range of Hydronix packaged systems including submersible & self priming lift stations, dry pit stations, multi-pump booster systems, circulation & transfer systems, above ground valve & control vaults, and a full line of controls. All of our pump packages are designed by our own engineers and are UL listed. All of our control panels are listed as UL508 or UL698A intrinsically safe.

The picture below shows the installation of a Hydronix 430 Series above ground vault. The gull



wing design houses the valves and control panel and allows “non-confined space” access for easy maintenance and repair. The submersible pumps (lower left hand corner) are installed on rails and are accessible through a separate hatch.



The picture above shows the installation of a Hydronix 421 series fiberglass wet well with an integral valve vault. The insert is a top view of the interior of the wet well and valve vault and shows the preinstalled hatches, pump rails, discharge piping and valves.

In future editions of Pipeline we will feature other Hydronix packaged systems. For more information on these packages contact your PumpTech branch for a Hydronix Engineered catalog.

Learn more at - [pumptechnw.com/hydronix.html](http://pumptechnw.com/hydronix.html)

## Pump Ed 101— Unbalanced Radial Thrust

By: Joe Evans, Ph.D

The radial forces that form about the periphery of the impeller of a single volute pump are proportional to total pump head, impeller diameter and the width of the vanes. They are seldom balanced, but they reach their lowest intensity between 80 and 100 percent of BEP flow. The actual low point depends upon Pump Specific Speed (Ns) and moves closer to BEP as Ns increases. This unbalanced radial thrust increases quickly as operation moves to the left of BEP and typically reaches its maximum value at shut off head. Radial Thrust intensity is also a function of Ns and increases with an increase in Specific Speed.

Increased shaft deflection is the expected result of an increase in unbalanced radial thrust. Excessive shaft deflection can lead to premature seal, bearing, and wear ring damage and failure. In extreme cases it can result in shaft breakage. One of my ongoing concerns is that the H/Q curves published by many pump manufacturers

allow operation in very questionable areas—some well below 50% of BEP flow. This may not be a problem with some low Ns pumps that operate at lower flows but, unfortunately, these broad operating ranges are often applied across the board. Increased radial thrust and the accompanying increase in shaft deflection can be especially problematic with higher head wastewater pumps due to the large vane width required to pass solid matter.

The Radial Thrust Calculator (Excel) shown below allows you to calculate unbalanced thrust at any point on the performance curve. It is available for download from the “Pump Sizing & Selection Tools” section of my educational web site. Click on the link below. It is also the topic for my January 2010 Pumps & Systems\*\* magazine column. If you have questions drop me an email.

[www.PumpEd101.com](http://www.PumpEd101.com) \*\* [www.pump-zone.com](http://www.pump-zone.com)

[jevans@pumptechnw.com](mailto:jevans@pumptechnw.com)

### Radial Thrust Calculator - Joe Evans [www.PumpEd101.com](http://www.PumpEd101.com)

Radial Thrust:  $F_R = K_R \times (H \times s / 2.31) \times D_2 \times b_2$

Enter the required data in the highlighted cells. If you do not know the pump specific speed use the Ns calculator below.

Thrust Factor (KR) @ flow point (from graph)	0.21
Head (H) per Stage @ flow point in feet	138
Specific Gravity (S)	1
Impeller Diameter (D2) in inches	11.88
Impeller Width (b2) @ discharge in inches	3.5
<b>F<sub>R</sub> (Unbalanced Radial Thrust in lbs) =</b>	<b>522</b>

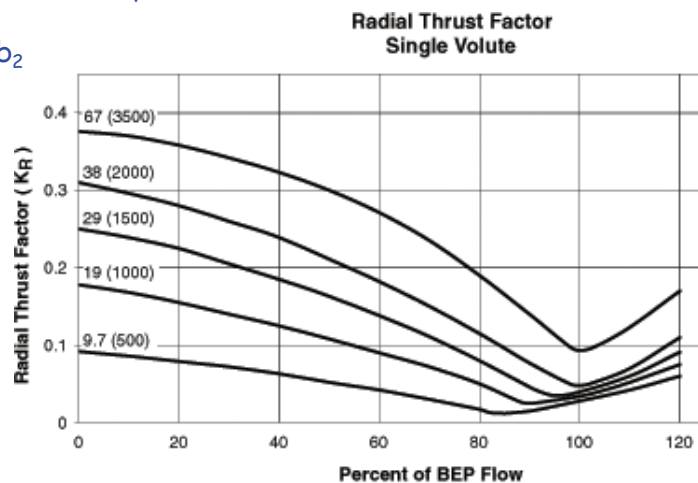
Pump Specific Speed:  $N_s = N \sqrt{Q} / H^{0.75}$

Enter the required data in the highlighted cells

Pump RPM (N)	1750
Flow (Q) @ BEP	1200
Head (H) @ BEP	110
<b>Ns =</b>	<b>1785</b>

#### Thrust Factor Instructions

The numbers in ( ) are Pump Specific Speed (Ns). The curves represent the radial thrust factor from 0 to 120% of BEP flow for that particular specific speed. Select a point on the X axis that corresponds to the point to be evaluated on the pump H/Q curve. The thrust factor is the value on the Y axis where the curve intersects the selected X axis value. For values of Ns that fall between the ones shown you may interpolate the intersection. Impeller width (b2) is the width in inches at the discharge including the shroud(s). The example shown is for a sewage pump with a specific speed of 1785, operating at 40% of BEP flow. At 100% of BEP Flow, Radial Thrust is reduced to 59 lbs.



## Packaged Metering Pump Systems by PumpTech Inc.

PumpTech acquired Meterman in 2005 so that we could offer an even broader range of packaged pumping systems. Scott Bush, the founder of Meterman, oversees our sales. Since 2000 Meterman has shipped over 400 (45 in 2009) chemical metering skids to industrial and municipal customers throughout the US and overseas. Sectors include the paper & chemical industry, oil & gas, power generation, and water & wastewater treatment. Some of our customers include Bayer, GE, Boise Cascade, Georgia Pacific, Weyerhaeuser, Kaiser Aluminum and Reynolds Metals.



Typical applications include pH control (caustic & acid), chlorine injection, biocides, polymers, retention aides, dyes & brighteners, dry powders, defoamers and many others.

Meterman skids can be extremely simple single pump systems, such as the chlorine



injection package seen to the left. Or, they can be multi pump systems like the phosphate injection skid on the left. More

complex units such as the polymer addition and hypochlorite skids on the right, include holding tanks and other dosing equipment. All packaged systems built by Meterman, including instrumentation and controls, are UL listed.



Meterman packaged metering systems employ the highest quality materials and are performance tested and certified prior to shipping. In future editions of Pipeline we will discuss Meterman features and benefits.



## Maintenance Tips

### “Building a Solid Foundation”

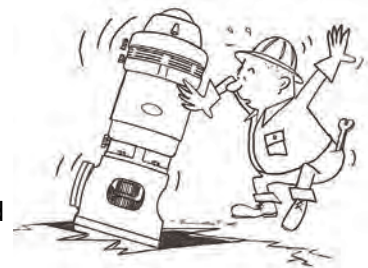
Ed Smith, PumpTech Moses Lake

Improper design and installation of pump base plates are common causes of premature pump and motor failures. In many cases, this leads to unscheduled downtime and costly repairs. Often overlooked is the construction and installation of the base plates and sole plates. Therefore; what better way to start this section on our first newsletter than emphasizing the importance of “Building a Solid Foundation”. This discussion will be provided in three parts over our first three newsletters focusing on base plate construction, anchor bolt selection and base plate installation.

Proper pump base plate construction and installation will achieve the following:

1. Reduce bearing and seal failures
2. Maintain better mechanical alignment
3. Substantially reduce vibration

Base plate construction significantly influences the reliability of the rotating equipment it supports. It should be rigid enough to avoid flexing or twisting under pump and motor operating loads.



These forces can cause the separation of the base and grout causing excessive vibration and misalignment of previously aligned shafts. Base plate flatness is also a major factor in aligning the shafts and should be within allowable tolerances. Base plate rigidity and flatness assures that alignment is maintained while starting, stopping and operation of the pumps. The mass of the base plate affects its capability to dampen vibration and provide increased component reliability. These factors should be carefully considered when selecting and installing a base mounted pump to assure the overall integrity of the complete system. More in the Summer issue.

## PumpTech PumpChat

### ***From the President's Desk***

#### **Introducing the PumpTech Pipeline**

As I travel and meet with customers I am typically asked what's new? It seems appropriate that as we enter our 24<sup>th</sup> year in business we move to a better media than word of mouth to let people know what is new at PumpTech. This first edition of the PumpTech Pipeline covers a wide band of topics covering some of the more unknown products and services we have to offer, success stories, as well as technical information.

To many it will come as a surprise that PumpTech can offer the latest in High speed turbo Blowers, Submersible sewage pumps with Premium efficient motors, and Packaged pump stations complete with cement block buildings. Our Meterman division provides the latest in packaged metering/dosing pump systems for industrial and municipal applications and that they have been put in service in the Middle East, Canada, the East coast and Midwestern United states. We offer educational seminars that are accredited for CEU's in both Washington and Oregon, and that we have an engineering department that provides design drawings of our packaged stations in 3D. PumpTech also provides all types of industrial pumps including those that pump everything from raw potatoes to hot oils and lubricants.

PumpTech has grown and evolved over the

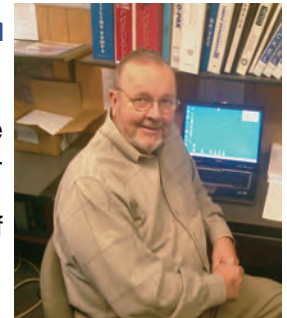
years and we hope that you find this informative, educational and worth your time reading. If you do please pass this on to any colleagues and associates.

Doug Davidson

[ddavidson@pumptechnw.com](mailto:ddavidson@pumptechnw.com)

### **Don Carlile Joins PumpTech**

Don brings over forty years of pump industry experience to his new position at PumpTech in Portland. He was one of the original owners of Hydronix and spent several years as Manager of Engineered Systems at Cornell Pump Company. Most recently he covered the Northwest for National Pump Company.



In his new position with PumpTech, Don will be responsible for municipal sales in NW OR and SW WA. We will also make use of his packaged systems background to promote our Hydronix and Meterman products throughout the US. Welcome aboard Don.

## **Upcoming PumpTech Participating Events - January– April 2010**

NW Food Processors Show -  
Portland, OR January 18 - 20

ERWOW Annual Conference & School -  
Yakima, WA February 16 - 18

Sammamish Plateau WSD School -  
Bellevue, WA February 25 - 26

Lakehaven Utility Distric School -  
Federal Way, WA March 5

AWWA/WW School -  
Eugene, OR March 14 - 16

Western Regional Boiler Association -  
Seattle, WA March 16 - 18

WOW (WETRC) -  
Wenatchee, WA March 22 - 25

AWWA/PNCWA Short School -  
Ontario, OR March 28 - 31



## ABS Delivers High Speed Turbo Blowers



**Star Idaho WWTP**

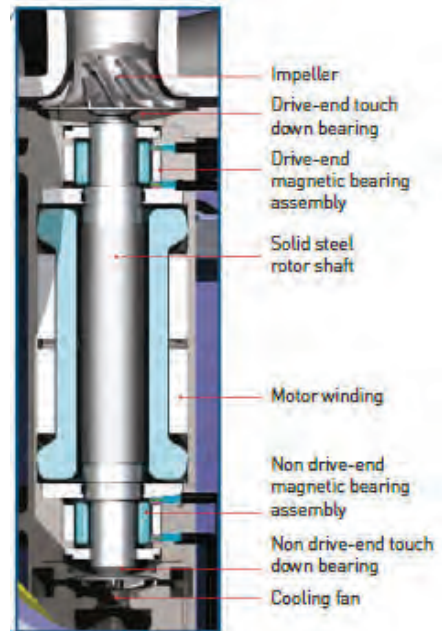
ABS (Meriden, CT) delivered one 200 HP High Speed Turbo (HST) Blower to Star, ID early last year. Because of its efficiency, the city was able to replace two blowers, of similar horsepower and reduced power consumption while increasing air flow capacity. The ABS HST Blower took approximately 1/3 of the footprint of the previous blowers and also reduced operating noise significantly. Because of its compact design and being a complete system, plant personnel were able to complete the bulk of the installation themselves saving a significant portion of their project budget. Due to its efficiency and the fact that the city saved money on the installation, the decision was made to purchase a second HST blower which was delivered late last year. The City is very glad to have selected ABS Blowers for their project and expect to recover the cost of the blowers in just a few years.

High Speed Tech, now part of ABS, pioneered high speed blower technology and has more working installations throughout the world than any other manufacturer. ABS blowers use a unique magnetic bearing technology with shaft position control, which eliminates bearing wear. It also virtually eliminates bearing friction and therefore reduces operating and maintenance costs significantly.

The first ABS HST Blowers, which were installed in 1996, have required only filter replacement and show no signs of wear to date. ABS HST blowers

qualify for ARRA and US energy saving incentive programs. ABS currently manufactures the largest and most efficient high speed blower available to-day.

The picture on the right is a cut away of a typical HST blower. It shows the integrated motor, impeller, and cooling fan. Also shown are the two magnetic bearing assemblies and shaft touch down bearing.



On the left is the new HST 40 which extends the operational range of the HST line. The new model offers flows of 2,600 to 10,200 SCFM at pressures of 5.8 to 12.3 PSI. Input HP ranges from 400 to 540. All units come

complete with an integral VFD for precise flow and pressure control

For more information contact your local Pump-Tech office or visit :

<http://www.absgroupusa.com/>.

### PumpTech Pipeline - Spring 2010

**Publisher**

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Mike Shoemaker, Sales

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### PumpTech Pipeline

A Publication of



12020 SE 32nd St #2

Bellevue, WA 98005

888-644-6686

