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## A NOTE ON THIS ISSUE:

Welcome to June's issue of MPT! In this month's Case Studies section (pg. 12), Soren Rasmussen of Landia shows how his company's submersible mixers helped a Montana wastewater treatment plant create savings of \$18,000 per year. See the details in "Big Energy Savings in Big Sky Country."

Speaking of savings, you'll want to continue into our Water & Wastewater Focus section for a contribution from Tsurumi America's Lauren Heinz (pg. 16). A coal mine in central Illinois scored huge annual savings of \$90,000 after switching to the



J. Campbell, Editor Modern Pumping Today

company's LH-6110 pumps for its underground dewatering needs, even after the mine's demanding applications proved too extreme for other pumps to handle.

Finally, we move from saving money to saving our most precious natural resource: water. The Water Tower, a new water innovation hub, has released its Lake Lanier Watershed Five-Year Research Plan, with the goal to protect and improve a critical water supply for North Georgia and Metro Atlanta. Kristan VandenHeuvel, the organization's strategic director of research and engagement, recently stopped by MPT's podcast, The Efficiency Point, to share more details (pg. 36).

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### SEEPEX NAMES NEW SALES MANAGER FOR AMERICAN WEST SEEPEX, a leading international

progressive cavity pump manufacturer, adds Ben Wells to the sales team as the territory manager for its West region. Emphasizing technology innovation,

SEEPEX takes a consultative approach to offering cutting edge products and customized process solutions for a wide range of applications in myriad industries and is an ISO 9001-2015 certified company.

Wells is a seasoned West Coast sales professional. According to the company, his knowledge and experience in pump technology and control systems makes him a great addition to the team. Wells will be supporting the SEEPEX West region consisting of California, Hawaii, Nevada, and Arizona.

## GRAPHALLOY NOW OFFERING VIRTUAL ENGINEERING MEETINGS

Graphite Metallizing Corporation, the manufacturer of self-lubricating Graphalloy bushing materials, announces virtual engineering meetings for customers who need bearing/bushing solutions in tough pumps, conveyors, ovens, and other extreme applications.

During the past year, Eric Ford, vice president of sales and marketing for Graphalloy, has been promoting virtual meetings with global sales representatives unable to visit customers in-person due to COVID-19 restrictions. Due to travel restrictions, these meetings have been a productive way to "visit" customers and help engineer upgrades to the Graphalloy bushing material.

"We are conducting multiple meetings per week now, all over the world," says Ford. "This solution allows us to present a graphic overview of the Graphalloy product line, including successful applications, while our engineers answer any of the customer's technical questions regarding design considerations."

Graphalloy Bushings offer solutions in places where traditional bearing lubricants will not work, including high temperature applications, clean environments, submerged operation applications, and more. The Graphalloy material is self-lubricating, non-galling, and can withstand vast temperature ranges. These qualities also make it a solution for pump bushings and wear rings, especially in low lubricity service and in pumps where dry start, dry running, or flashing are issues.

"These virtual meetings benefit our customers by allowing various members of our support team to participate, while the customer can invite multiple members of their team, from various locations, to attend at the same time. It's much more dynamic and detailed than simply sending emails back and forth," adds Ford.





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### PROGLOVE PARTNERS WITH IVANTI WAVELINK

ProGlove, the leader in ergonomic wearables for industry, partners with Ivanti Wavelink, a global leader in supply chain mobility solutions, to help organizations turn their warehouse management legacy systems into more modern, state-of-the-art technology. Through this partnership businesses can benefit from an effortless transformation process that can be integrated right out of the box and hooks up ProGlove's leading wearable MARK Display barcode scanners with warehouse management or backend systems by means of Ivanti's Velocity solutions.

The first organizations to profit from this partnership include Hermes Fulfilment, a member of the Otto Group. Hermes Fulfilment handles the entire shipping process including customer orders, warehousing and returns for Otto Group's retail companies. The combined solution allows for easy integration of Telnet and browser-based applications to communicate and deliver crucial information to and from workers' rugged mobile computers and wearable devices.

Ivanti Velocity platform helps companies leverage modern technology in the warehouse and across the supply chain to improve accuracy and efficiency without modifying or replacing legacy backend systems, while maintaining and improving workers' productivity.

## OKUMA AMERICA CORPORATION NAMES PARTNER FOR TRAINING ACADEMY

Leadership teams from Okuma America Corporation, a builder of CNC machine tools, controls, and automation systems, and Rowan-Cabarrus Community College (Rowan-Cabarrus) announce a corporate training partnership between the two organizations.

The Okuma-Rowan-Cabarrus partnership will provide technical training to Okuma customers, distributors, and employees at the new Okuma Machine Tool Academy (OMTA) located within the College's Advanced Technology Center on the North Carolina Research Campus in Kannapolis. The academy is expected to house several Okuma flagship products, including an Okuma LB3000 EX II and an Okuma GENOS M460V-5AX.

Courses commence in October 2021 and will be offered in three focus areas: electrical maintenance, mechanical maintenance, and programming and operations. All courses will be led in-person by a full-time instructor, and online and hybrid course offerings will be made available in the future.

The state-of-the-art Advanced Technology Center opened its doors in 2019 and is over 53,000 square feet. It provides various classrooms, collaboration spaces, and lounges for program participants. The academy was built for industrial machine tool training and is equipped with overhead utilities and six-inch level concrete floors.  $\blacklozenge$ 



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SWPA INSIGHT

## Setting Your Safety Standards and Maintenance Schedule

## When RTF is not an option, operators rely on real-time data to extend pump life

By SWPA Executive Director Adam Stolberg and Jeremy Drinkwine, SJE Inc.

or wastewater applications, setting safety standards and a maintenance schedule are key components to ensuring reliable operational efficiency in often unpredictable conditions. From determining who should be the stakeholders involved to establishing a checklist for routine inspections, there are some basics every pump owner should include. Below, SWPA Executive Director Adam Stolberg and Jeremy Drinkwine, business development manager for Primex Controls, a brand of SJE Inc., discuss the benefits of staying one step ahead of routine wear.

Remote monitoring options are more widespread than ever before. How does access to more data lead to longer pump life? Having the ability to view the system as a whole allows owners more insight. High amperage, high levels, and no pumping are just a few of the items that they can monitor. Being able to monitor what is happening in the wet well gives owners the ability to potentially diagnose issues before failures happen. Furthermore, by having the ability to track high usage to low usage, this also allows owners the ability to potentially schedule repairs or maintenance on non-peak days.

In addition to adhering to safety standards and following a maintenance schedule, what role can system redundancy play in maximizing performance and ROI on a wastewater system? System redundancy can limit the amount of potential down time a system has. From back-up controllers to back-up instrumentation, these all impact the amount of downtime a system can have. Some designs have additional pumps built into the system this allows for some systems to be without one pump.

## For those wastewater applications where running to failure is not an option, how can pump owners move from preventative to predictive models for maintenance?

The use of PLCs and remote monitoring is becoming very popular. Even SCADA systems call apply here. Plus, the amount of information that can be monitored, whether it's from a SCADA or remote monitoring, can provide predictive analytics. From viewing amperage to seal-fail alarms, these are all types of information that can now be shared on many different platforms. This also goes along with the traditional elapsed time and cycle counts per pump to help assist in routine maintenance. This will allow routine pump maintenance to prevent failures. By monitoring amperage, this allows the owner to see trends if low or high amperage is present. By having the ability to monitor seal fail, this also gives the owners a first look to repair issues before they become major failures.

## What role can professional organizations like SWPA play in assisting pump owners in finding the right standards and schedule for them?

SWPA has many professionals and companies as part of its membership. It has most of the major pump companies on its roster and control panel experts. SWPA members can answer almost all questions and provide guidance in most scenarios. You would just want to make sure SWPA suggestions are in line with what local authorities have in place when it comes to electrical standards.







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Landia mixers have been installed at Chinook since 2004.

## **Big Energy Savings** in **Big Sky Country**

## Stalwart submersible mixers help Montana wastewater treatment plant

By Soren Rasmussen, Landia

hen the small team at Daffy Hills Lane selected their new mixers as part of plant upgrade in 2004, they chose very wisely indeed—and not just because those same mixers are still dutifully working away today.

Purchased initially so that a 50-horsepower surface rotor aerator could be switched off during night-time hours of low BOD loading, the two 5-horsepower submersible mixers (manufactured by Landia), have created energy-savings of \$18,000 per year, meaning that the payback for the whole mixer installation was just less than four and a half years.

"The savings speak for themselves," says Eric Miller, superintendent at Chinook's Wastewater Treatment Plant in the far north of Montana, "but the benefits have been manyfold."

#### CHINOOK: UP CLOSE

The largest city in Blaine County, with 1,500 residents, Chinook is set in the heart of the Milk River Valley, where farming and ranching still prevail—but it is known as the home of the Sugarbeeters, from the days of the Utah-Idaho Sugarbeet Company, which operated in the city for twenty-six years.

Chinook's wastewater treatment plant first went online in 1984—a single oxidation ditch equipped with dual aeration rotors that was constructed to provide total suspended solids (TSS) and biological oxygen demand (BOD) removal. The original installation was designed for ammonia removal, but not for total nitrogen (TN) nor total phosphorus (TP) removal.

"Before the mixers were installed." adds Miller, who has served the wastewater treatment plant for over twenty years, "we were over 4 micrograms per liter for phosphorus removal and close to 30 micrograms per liter for Nitrogen removal-but now, as well as the energy savings, we achieve effective, consistent nitrogen removal from the same 1984-vintage oxidation ditch treatment plant that was modified in 2004 for energy efficiency, but never actually designed for nutrient removal. Today, with much tougher regulations, we have our ammonia at almost zero, nitrogen at 2 micrograms per liter (required for permit reissuance since 2012) and phosphorus at just 1 microgram per liter—all from the same mixers, installed sixteen years ago."

### THE LANDIA SOLUTION

In the original plant, both of the oxidation ditch rotors ran continuously, resulting in a surplus of dissolved oxygen (DO). To allow for the cycling of the fixed-speed aeration equipment, the Landia mixers were installed to produce liquid velocity and mixing so that solids would continue to stay suspended and circle the oxidation ditch with the rotors turned off. With no other tank to go to, there was no option to shut down, so the submersible mixers were installed in a full tank by means of Landia's unique guide rail system, which allows the plant to continue operating non-stop during installation. Landia also provided a set of custom-built service platforms.

"Landia made it very simple for us," continues Miller, "and on the very rare occasions we've needed a spare part in sixteen years, they have ever since. The mixers just keep on going. We never expected this level of service!" Immediate 50 percent improvement was observed in nitrogen removal.

## STARTING THE CYCLE

In 2012. Chinook staff attended a two-day training class sponsored by the Montana Department of Environmental Quality (DEQ). Using the knowledge they gained, staff experimented with extended air-off cycle times. By allowing the dissolved oxygen in the ditch to cycle between anoxic and oxic conditions, an immediate 50 percent improvement was observed in nitrogen removal. No equipment was purchased; no funds were expended. In fact, because of reduced rotor operating time, electrical costs were further reduced. And, as a result of



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## CASE STUDIES



Landia mixer with service platform in oxidation ditch at Chinook.

the lower tank dissolved oxygen concentrations, some incidental improvements in total phosphorus removal also occurred.

With just Miller and his two colleagues, Cory Fox and Matthew Finley, keeping the Chinook plant running, the introduction of an ORP (oxidation-reduction potential) system—allowing control of the on/off cycles of the rotors and mixers, has been a welcome addition.

#### MAKING LIFE EASIER

Even this very remote small city receives all the usual non-flushables

Mixer start up at Chinook, where Landia has helped the wastewater treatment plant save \$18,000 annually.



that treatment plants have to contend with, though Miller admits that the wastewater it receives from its one industrial user—a local slaughter house—is a helper rather than a hinderer for BOD levels.

## \$18,000 in energy savings annually.

"The introduction of SCADA has made life a bit easier," says Miller, "but then the Landia mixers have never given us any trouble. Back in 2004 they were our biggest capital expense, but as well as achieving the \$18,000 pa in energy savings, they have enabled us-a plant not designed for that purpose, to achieve full nutrient removal and process optimization. The old 50-horsepower rotors produced lots of air that we simply didn't need all the time. We needed to save money and had looked at soft starts to reduce spikes, but running the mixers for around thirteen and a half hours per day has proved so much more economical than what we had before."

He adds, "Where electricity costs are higher, the return on investment (ROI) would be even better for the savings we've enjoyed here in Chinook. Over the years we've understandably had to see to the odd seal, but with their standard bearings, maintaining the Landia mixers is a piece of cake just a bit of grease and oil." ◆

Soren Rasmussen is the director of Landia, Inc. Landia provides pumping and mixing solutions to industries such as agriculture, wastewater, biogas plants, and the fish industry worldwide. For more information, call 919.466.0603, email info@landiainc.com, or visit www.landiainc.com.



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## Doubling Service Life and Minimizing Repair Downtime

## Tsurumi LH Series pumps save Illinois coal mine dewatering costs

By Lauren Heinz, Tsurumi America, Inc.

coal mine in central Illinois is making huge annual savings of approximately \$90,000 after switching to Tsurumi LH-6110 pumps for its underground dewatering needs. After the extremely harsh application environment proved too challenging for a competitor's solution to handle cost-effectively, Tsurumi high-head



submersible pumps were installed just over three years ago and have proved to be the ideal solution for the site's operations.

## REPAIR COST CONCERNS

When it was first opened sixteen years ago, the mine used a turbine in a shaft to pump water into a

sump. In 2014, the mine replaced the turbine with a competitor's 275-horsepower

pumps to solve the occurring problems caused by running dry. Despite the slight improvement in efficiency, this model's short life expectancy and high repair costs quickly proved to be a big financial burden.

> As B.J. Mays, pump maverick at Buchanan Pump Service (BPS), which handles the mine's pumping systems, explains, "Those pumps cost about \$97,000 brand

new, and every three to six months, they needed repairs costing about \$49,000 to \$52,000 on average. It would always require a complete replacement of the impeller, suction cover, and upper and lower housing."

Having been a Tsurumi partner for a decade, BPS drew on its vast expertise gained from almost fifty years in the pumps business and advised installing Tsurumi's LH-6110 pumps instead. At roughly half the price of the previous units they replaced, the immediate benefits were obvious, but it remained to be seen how they would fare under such challenging conditions.

"The mine ordered three of these pumps, keeping two in operation and one on standby for when one of the others needed a service," Mays says. "The average run time is four months, but I have seen upwards of six months depending on the circumstances. But although their lifespan is about the same as before, and they require the same attention as far as maintenance goes, the repair costs are approximately 50 to 60 percent less. Parts availability has gone from six weeks to one week, and over the past three years of service, there has never been a motor failure."

## **PROJECT AT A GLANCE**

- An estimated \$90,000 in annual savings results from the less-expensive initial purchase and regular servicing costs of the Tsurumi units.
- The mine's demanding applications proved too extreme for a competitor's solution to handle cost-effectively.
- Three Tsurumi LH-6110 pumps replaced the previous system three years ago and, despite the harsh application, the pump motors have never failed.

#### SHIFTING SANDS

As these pumps are constantly running at 3600 RPM (a high speed not usually recommended for highly abrasive applications) for eight to twelve hours every day of the year, this is a notable achievement. Mays points out that the level of solids—i.e., clay, sand, silt, and coal fines—in the water is at a ratio of about 1:2, which, coupled with the amount of head required on the application, makes it an extremely aggressive job to handle.

"These are general-purpose dewatering pumps, so every four months or so we replace certain parts as a precaution," Mays says. "We order a new impeller and a new suction head—they are both high-chrome and are rarely heavily worn, but when the pump has over 500 feet of vertical head, they have to be in perfect condition."

BPS also adopted a common tactic of adding a tungsten carbide coating to the parts that receive the most damage, namely, the upper and lower housing, which has effectively doubled each pump's typical service life to six months. As the approach has been successful for the coal mine, it recently purchased a fourth LH-6110 pump, which is currently at BPS's production floor waiting on the tungsten carbide parts to come back from the coaters.

Headquartered in Pound, Virginia, Buchanan Pump Service services customers from four locations and forty-four trucks, providing a twenty-four-hour service. A full-service pump company with approximately





\$3.6 million of inventory, it offers pumping solutions from concept to installation, along with training, and provides a remanufacturing—rather than repairs—facility.

#### HIGH PRESSURES AT GREAT DEPTHS

Designed to withstand high pressures when used at great depths, such as in deep well draining, the LH three-phase high-head pumps feature a cast iron casing and motor frame, a stainless-steel shaft, and an impeller made from a chromium iron casting. The 74 5/16-inch-tall LH-6110 model relies on a powerful 150-horsepower motor to deliver approximately a 700 gallons per minute maximum capacity through its 6-inch discharge, ensuring the mine remains as dry as possible.

"This company also operates a couple of other smaller mines, which use Tsurumi GSZ, GSD, and KRS pumps," Mays adds. "They trust the Tsurumi name and we've never had a complaint. What impresses me is that, over the years we've had maybe thirty of the LH pumps come into the repair shop, and even with all the abuse they take, I have never once had to replace a motor."

Tsurumi America, Inc., a division of Tsurumi Manufacturing, was founded in 1979. Tsurumi is active in forty-five countries and has been an innovator in the pump industry since 1924. Tsurumi America is a provider of leading pumping technology in construction, civil engineering, mining, industrial wastewater, domestic wastewater, sewage treatment, flood control, and scenery creation fields. All Tsurumi products are backed by independent, third-party verification. Beyond leading pump technology, Tsurumi America is recognized for its robust distribution network and one of the largest on-hand inventories in North America. For more information, visit **www.tsurumipump.com/lh-series.** 



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## **Controlling Dangerous Dusts in the Chemical Processing Industry**

## Part 2 of 2

By David Steil, Camfil Air Pollution Control

In the previous month's introduction, we set out to examine the dangers of combustible dust generated in chemical processing facilities, applicable regulatory guidelines, and how to use a high-efficiency dust collector to keep workers safe and facilities in compliance. Below, we will discuss the regulations governing combustible dust as well as look over techniques for mitigating combustible dust and its exposure.

## **REGULATIONS GOVERNING COMBUSTIBLE DUST**

In the United States, there are three key entities involved in combustible dust issues, each with its own particular area of responsibility:

- NFPA sets safety standards regarding combustible dust, amending and updating them on a regular basis. NPFA's standards aim to prevent an explosion, vent it safely, and ensure that it will not travel back inside a building. Most insurance agencies and local fire codes state that NFPA standards shall be followed as code. Exceptions would be where the authority having jurisdiction (AHJ), such as local fire marshals, specifies an alternative safety approach, which might be even more stringent.
- **OSHA**, together with local authorities, enforces NFPA standards. OSHA's Combustible Dust National Emphasis Program (NEP) outlines policies and procedures for inspecting workplaces that create or handle combustible dusts. OSHA began rulemaking in October 2009 for a general industry standard for combustible dust; however, the agency has yet to issue a proposed rule.

See Part 1 on modernpumpingtoday.com

• U.S. Chemical Safety Board (CSB) is an independent federal agency responsible for investigating industrial chemical accidents. Staff members include chemical and mechanical engineers, safety experts and other specialists with chemical industry and/ or investigative experience. The CSB investigates combustible dust explosions, sifting through evidence to determine root causes and then publishing findings and recommendations. For example, one CSB study identified 281 combustible dust incidents between 1980 and 2005 that killed 119 workers, injured 718, and extensively damaged industrial facilities. Since that time, the CSB continues to identify serious dust-related incidents on a regular basis.

## RELEVANT NFPA STANDARDS

In trying to sort through the list of combustible dust standards, a good starting point for every chemical processing facility engineer or manager is NFPA 652, the Standard on the Fundamentals of Combustible Dust. This covers the requirements for managing combustible dust fires and explosions across industries, processes and dust types. This standard applies to all facilities and operations that deal with combustible dust, not just hazardous or classified locations. For chemical processors, this means they are required to perform a dust hazard analysis (DHA). The owner or operator of any facility where combustible dust exists is responsible for conducting a DHA to identify the hazards, create a plan for managing the hazards and providing training for anyone affected by the hazards.

**NFPA 654** (Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and

Handling of Combustible Particulate Solids) is an allencompassing standard on how to design a safe dust collection system. It is the most general on the topic, and it will lead you to other relevant documents. Depending on the nature and severity of the hazard, NFPA 654 will guide you to the appropriate standard(s) for explosion venting and/or explosion prevention.

**NFPA 68** (Standard on Explosion Protection by Deflagration Venting) focuses on explosion venting on devices and systems that vent combustion gases and pressures resulting from a deflagration within an enclosure, for the purpose of minimizing structural and mechanical damage.

**NFPA 69** (Standard on Explosion Prevention Systems) covers explosion protection of dust collectors when venting is not possible. It includes the following methods for prevention of deflagration explosions: control of oxidant concentration, control of combustible concentration, explosion suppression, deflagration pressure containment and spark extinguishing systems.

**NFPA 70** (National Electrical Code) covers everything related to the installation of electrical equipment across all industries and all types of buildings. This code is enforced in all fifty states. Chemical processors need to be aware of two main sections of NFPA 70 because they apply to housekeeping: Combustible dust definition and hazardous locations. NFPA 70 defines combustible dust as "dust particles that are 500 microns or smaller and present a fire or explosion hazard when dispersed and ignited in air." The NEC defines different classes of hazardous (classified) and non-hazardous locations. These classes determine the wiring of buildings and also the equipment and housekeeping procedures that can be used in different areas of facilities.

### MITIGATING COMBUSTIBLE DUST— DUST HAZARD ANALYSIS

In chemical processing it is critical to know the explosive potential of the dusts, gases, and dust/gas mixtures emitted during operations. NFPA states that a dust hazard analysis is needed to assess risk and determine the required level of fire and explosion protection from combustible dust. The analysis can be conducted internally or by an independent consultant, but either way the authority having jurisdiction will ultimately review and approve the findings.

The first step in a hazard analysis is determining whether your dust is explosive. NFPA classifies dusts according to their explosibility, that is, their "Kst" value. Kst is the normalized maximum rate of explosion pressure rise. A bar is a metric unit of pressure, which is slightly less than the average atmospheric pressure on earth at sea level. NFPA Class ST1 dusts are rated below 200 Kst, Class ST2 dusts range from 200 to 300 Kst, and Class ST3 dusts are rated above 300 Kst. As a rule of thumb, when dusts approach 600 Kst, they are so explosive that wet collection methods are recommended. However, any dust above 0 Kst is considered to be explosive, and the majority of dusts fall into this category. If OSHA determines that even a very low Kst dust is present in a facility with no explosion protection in place, a citation will result, per OSHA's NEP policy.

In addition to Kst, it is important to know other combustible dust properties such as Pmax (the maximum explosion pressure of a dust cloud, measured in bar) and Pred (the maximum pressure developed in a vented enclosure during a vented deflagration). These can be determined using ASTM E 1226-10, Standard Test Method for Explosibility of Dust Clouds.

Your dust collection equipment supplier will need the Kst and Pmax values in order to correctly size explosion venting or suppression systems. Failure to provide this information may increase your costs, since the supplier will have to use worst-case estimates of the Kst and Pmax values or may even refuse to provide the equipment.

In addition to conducting explosibility testing to determine whether a dust is combustible, it is important to analyze other dust characteristics to determine the best dust collection system and filters for your chemical processing operation. Other key dust properties to know include particle size, dust shape, gravity, moisture level, and abrasiveness. Understanding these components lend to the optimal design of dust-control equipment. Quality equipment suppliers can conduct this type of dust testing and work with you to specify the best system for your application.

### DUST COLLECTORS AND EXPLOSION PROTECTION

Combustible dust explosions are a risk in many areas of a chemical processing plant, but a critical location is the dust collection system itself. There are many types of explosion protection devices and systems used to help dust collection systems comply with NFPA standards. They fall into two general categories: passive and active.

Passive systems react to the event, while active systems detect and react prior to or during the event. The goal of a passive system is to control an explosion so as to keep employees safe and minimize equipment damage in the plant. For example, designed to install over a standard explosion vent, a flameless vent is one type of passive device that extinguishes the flame front exiting the vented area, not allowing it to exit the device. This allows conventional venting to be accomplished indoors where it could otherwise endanger personnel and/or ignite secondary explosions. A safe area around the flameless vent still needs to be established due to the release of pressure and dust/gases.

An active system, by contrast, can prevent an explosion from occurring. An active system involves more expensive technology and typically requires recertification on a regular basis. These systems can include chemical isolation or suppression, or mechanical options such as a valved designed to close within milliseconds of detecting an explosion installed in either inlet and/or outlet ducting.

### ADDITIONAL PRECAUTIONS

When planning and designing explosion protection, don't overlook additional devices and materials that can help reduce fire risk within the dust collection system. For sparkgenerating applications, a range of features and technologies are available, from flame-retardant and carbon anti-conductive filter media to spark arrestors in the form of drop-out boxes, perforated screens, or cyclone devices installed at the collector inlet. Fire sprinklers and active fire extinguishing systems may also be required with some installations.

In high dust loading applications, a dust collector that uses vertically-mounted filter cartridges can also reduce fire and explosion risks. This type of arrangement uses gravity along with the pulse cleaning system to effectively and efficiently remove dust from the filters and the collector housing. With some horizontally mounted cartridges, high loading dust becomes trapped in the pleats in the upper third of the filters. This trapped dust can burn even if the filter media is fire retardant.

### SUMMARY

Effectively controlling the dusts generated in chemical processing facilities is an essential life-saving and legal

obligation. Dust can cause serious harm to employee health, reduce product quality, and cause devastating explosions that can hurt or kill workers and bring irreparable damage to your operation.

A high-efficiency dust collector designed specifically for your operation is an accepted and proven engineering control that will filter hazardous contaminants and combustible dusts to make indoor environments safer. With the help of engineering consultants and reputable and experienced equipment suppliers, chemical processing facilities can minimize risk factors and maximize combustible dust safety.

Camfil Air Pollution Control is one of the world's largest manufacturers of industrial dust, mist, and fume collection equipment. As part of the global Camfil Group, we're represented on six continents and draw upon over five decades of experience and expertise to ensure that our customers are kept safe and productive. Every manufacturing process creates some kind of dust, mist, or fume. These byproducts can be harmful to workers, and they can cause machinery to become less efficient. Camfil APC's product range is designed to keep your workforce safe and healthy, and ensure that your operations and processes remain as efficient as possible. For more information, visit **www.camfilapc.com**.



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## PUMP SOLUTIONS



Flygt 3000 Series electric submersible pumps are a cost-effective and environmentally friendly rental alternative to diesel-driven pumps.

## Electric Submersible Pump a Gamechanging Rental

Xylem's Flygt N 3312 electric pump provides non-clog sewer bypass solution

By Ken Albaugh, Xylem

L ocated forty-five miles south of Nashville, the city of Columbia, Tennessee, has a population of approximately 36,000 people and is the county seat of Maury County. As part of its wastewater system, the city maintains 317 miles of gravityenforced main sewer lines, twenty-five pump stations, and a 14 million gallons per day wastewater treatment plant. In recent years, Columbia has engaged in sewer rehabilitation projects to help reduce or eliminate system overflows, including renovating and replacing several existing pump stations.

Among the pump stations slated to undergo scheduled upgrades sometime in 2020 was the Santa Fe Pike pump station. But before those repairs could begin, the station experienced a major pump failure during the spring of 2020 that led to sewage overflows, spurring the city of Columbia to engage Xylem Rental Solutions for emergency pump rental. The local Nashville branch quickly dispatched a Godwin HL250 diesel pump for an emergency sewer bypass system.

### PROJECT AT A GLANCE

Customer:	Columbia Wastewater Department, Columbia, Tennessee
Challenge:	To select a suitable electric bypass pump for a long- term temporary sewer bypass project.
Xylem Solution:	The Xylem Rental Solutions team engineered a custom temporary bypass system using the Flygt N 3312 electric pump as the primary pump.
Results:	The temporary bypass system has been running continuously for eight months without clogging. Using an electric bypass pump resulted in cost savings of nearly \$124,000.

## THE CHALLENGE

Once the initial crisis was under control, the city of Columbia decided to move ahead with the \$1.2 million planned upgrades for the Santa Fe Pike facility. City officials hired W&O Construction as the contractor on the project. To maintain treatment operations while the upgrades were completed, W&O Construction needed to set up a temporary sewer bypass system, and because rehabbing the pump station would take several months to complete, the Columbia Wastewater



## PUMP SOLUTIONS



The Xylem team used a horizontal, dry pump installation for the Flygt N 3312 pump.

Department made the decision to switch to electricdrive pumps to improve pumping efficiency and reduce operating costs. For temporary bypass projects that last longer than three months, electric bypass pumps are a cost-effective option as they do not rely on expensive diesel fuel.

However, Xylem Rental Solutions hit a snag in the process—the only Godwin electric option in the local fleet (Godwin HL250 pump with a 450 horsepower motor) was too powerful for the site's 400 amp service.

"The local station didn't have the correct electrical setup for the 450 horsepower pump," explains Bill Beasley, regional sales manager, Xylem. "The pump our competitor recommended to W&O Construction as an alternative isn't made to pump solids. We knew clogging would be an issue."

Seeking to ensure the Columbia Wastewater Department had the right electric pump and equipment for its temporary bypass system, Xylem's Nashville branch tapped the experience and expertise of its national Xylem Rental Solutions base to identify the best solution within its expansive rental fleet.

#### THE XYLEM SOLUTION

Very quickly, the Nashville team looked to Xylem's Flygt pump line. "It took about 90 seconds to go through the Flygt options and identify a 3000 series Flygt pump with priming," says Beasley.

For municipalities like the city of Columbia that need to engage in lift station repairs or plant upgrades, Flygt 3000 Series submersible pumps are a cost-effective and environmentally friendly rental alternative that provides a quiet, efficient, and easy-to-install bypass solution for many applications.

Xylem offers a wide horsepower range of its versatile Flygt 3000 electric submersible pumps—from 2 to 470 horsepower—that can handle flow rates up to 16,000 gallons per day with heads up to 400 feet. The broad parameters of the Flygt 3000 series enabled Xylem to select the proper pump for this application. In particular, the Flygt 3000 Series pumps feature patented N-technology with innovative self-cleaning impellers, which are designed to prevent clogs and build ups. Made with robust, hard iron impellers that are corrosion and abrasion resistant, they also offer a long life-span.

The Xylem team quickly identified the Flygt N 3312 submersible pump as the best model for the Santa Fe Pike pump station bypass. But while the Flygt N 3312 met the flow and head characteristics, it was too large to fit down the sewer manhole. To address this new challenge, the Xylem team used a horizontal, dry pump installation. The Flygt N 3312 pump was delivered to Xylem's dewatering fabrication center in Carterville, Illinois, where a crew built stands for both the pump and priming system within one working day. By the end of the weekend, the custom-engineered pump and priming system were delivered to the temporary bypass site in Columbia, Tennessee, where the rental solution operated continuously for the duration of the bypass.

"We took the technology off the Godwin priming system and married it to the Flygt pump performance," Beasley explains.

### RESULTS

With the Flygt N 3312 electric pump serving as the primary pump and the HL250 diesel pump still onsite as the backup pump, the temporary bypass system has been running continuously with no issues and no clogging. Additionally, the use of an electric bypass pump over a conventional diesel-powered pump has improved pump efficiency and reduced costs, resulting in savings of nearly \$124,000 to date.

Going forward, Beasley says the custom electric bypass solution could be a game changer in the sewer bypass market.

Xylem Rental Solutions has deep professional expertise, a broad product fleet, advanced engineering processes and facilities, and the latest technologies to solve temporary bypass challenges like this one. The company's technological authority enables it to customize and optimize its rental solutions to help customers solve complex water problems.

"This is the true power of Xylem when we all work together," says Beasley.  $\blacklozenge$ 

**Ken Albaugh** is director of rental and equipment sales for Xylem. As the global leader in engineered water technology projects, Xylem Rental Solutions can help customers solve even the most complex water challenges. Whether customers require fast-track temporary emergency response or reliable longterm operation, Xylem can design, build, and manage scalable turnkey systems that provide greater efficiency, reliability, and peace of mind. For more information, visit **www.xylem.com**.



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## MOTOR SOLUTIONS



T is estimated that by 2050, the global population will rise to 9.7 billion, from 7.7 billion in 2019. The global economy is expected to more than double over the same period. Urbanization, automation, and the rise of living standards will increase the demand for energy globally. More than half of the world's population now lives in cities and towns, and the United Nations projects that the global urban population will increase to around 68 percent by 2050. If we continue with business as usual, this scale of expansion will accelerate climate change, and degrade the quality of air and water upon which all living organisms depend. To protect the environment without tempering economic growth, we need to redouble our commitment to reducing the consumption of energy and natural resources.

In keeping with global trends, the demand for electric motion, i.e., drive systems powered by electric motors, is expected to grow significantly. According to the IEA, industry accounts for 37 percent of global energy use and 24 percent of global  $CO_2$  emissions, and buildings account for around 30 percent of energy consumption and 28 percent of  $CO_2$  emissions. A large proportion of this activity is associated with electric motors. It is estimated that roughly 70 percent of electricity consumed by industry is used by electric motor systems. In commercial buildings, 38 percent of electric energy consumption is for motors.

## Achieving the Paris Agreement

The vital role of high-efficiency motors and drives in reducing energy consumption Part 1 of 2

By Morten Wierod, ABB Motion



Electric motors have been in use for 150 years, and they have steadily improved over time. Yet for the past decade, they have undergone a period of exceptionally rapid technological advancement. The latest wave of improvements has opened the door to a significant reduction of the carbon footprint of industrial and commercial electric motors in the immediate future. An expanding range of highly energy-efficient electric motors (rated IE3 or higher) and the variable-speed drives (a.k.a. "frequency converters" or "AC drives") that can be used to run them are now available on the market.

These technologies hold the key to enabling many of the signatory countries of the Paris Agreement to meet their carbon reduction targets over the course of the next ten years. The scope of their impact is potentially enormous.

But to realize the full benefits of high-efficiency motors and drives, all stakeholders have critical roles:

- Public decision-makers and government regulators will need to incentivize their rapid adoption.
- Businesses, cities, and countries need to be aware of both the cost savings and environmental advantages and be willing to make the investment.
- Manufacturers like ABB will need to provide the necessary technologies and continue to drive innovation that improves energy efficiency.
- Investors need to reallocate capital towards companies better prepared to address the climate risk.
- Public education programs will be required to explain and promote the value of these upgrades.

Such steps have already been taken to support the uptake of electric vehicles and renewable energy sources. It is past time to do the same for a sustainable technology that promises to deliver even greater benefits for the environment and the global economy.

## THE CRITICAL ROLE OF ELECTRIC MOTORS

Modern, high-efficiency motors, paired with variablespeed drives, are designed to be flexible and reliable. Yet



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above all, they are extremely efficient, offering significant reductions in power consumption compared with older systems. Their importance in the development of a sustainable society cannot be overstated. Since 45 percent of the world's electricity is used to power electric motors in buildings and industrial applications, any investment in upgrading the equipment used in these systems will yield significant rewards in terms of efficiency and sustainability. While they may not be highly visible, electric motors are ubiquitous, an integral part of global industry and our everyday lives.

Small motors are found in the compressors used in air conditioners and refrigerators, in car windows, computer printers, the cooling fans of electronic appliances, and countless other common devices. Mid-sized motors appear in heating, ventilation, and air conditioning (HVAC) systems, as well as in elevators, rapid transit vehicles, and electric and hybrid automobiles. They are used extensively in industry, for pumps, conveyors, fans, and mechanical motion of all kinds. The largest electric motors are found in railway engines, cable cars, ship propulsion systems, and heavy equipment of the sort used for mining and paper mills.

While large motors, drawing more than 375 kW of power, represent only 0.03 percent of all motors in use, they nonetheless account for about 23 percent of all electric consumption by motors globally, or 10.4 percent of all electric power usage. The smallest motors, with an output of



## MOTOR SOLUTIONS



less than 0.75 kW output, account for just 9 percent or so of electric motor power consumption.

The majority of electric power consumed by motors is used by mid-sized motors. Many of these are larger than necessary for the applications at hand and are often run at full speed, even when the extra power is not needed. Roughly 75 percent of the industrial motors in operation are used to run pumps, fans, and compressors, a category of machinery that is highly susceptible to major efficiency improvements. The potential reductions to be achieved in energy consumption and carbon footprints are dramatic, to say the least.

#### MOTORS AT THE FOREFRONT OF EFFICIENCY AND REDUCED EMISSIONS

The trend in industrial engineering has been toward the utilization of more and smaller motors, optimized for specific tasks. Matching the output of a motor to the maximum power required for a task already represents a major step toward achieving greater energy efficiency. Arguably this efficiency can come at the cost of greater complexity. But in the latest systems, this complexity is effectively addressed by implementing smart sensors and internet-connected monitoring systems that can alert operators when any given motor shows signs of needing repair or replacement.

At the same time, modern motor designs offer higher efficiency than in the past. A motor's efficiency equals its mechanical output power divided by its electrical input power. The most common type of electric motor in use is the alternating current (AC) induction motor, based on the designs developed in the nineteenth century by Galileo Ferraris, Nikola Tesla and Mikhail Dolivo-Dobrovolsky. These motors have steadily improved over the years, based on changes in materials and stator and rotor designs.

It may be worth pointing out that even an ordinary induction motor is highly efficient compared to any internal combustion engine. The thermal efficiency of the engine powering a typical passenger car is rarely better than 35 percent. Almost any electric motor of comparable output achieves an efficiency of more than 90 percent.

Modern induction motors are available at very high levels of efficiency. Motor efficiency is rated according to a scale published by the International Electrotechnical Commission (IEC). Motors categorized as IE1 or IE2 are comparatively inefficient. A 200 kW



AC induction motor that meets the IE3 standard achieves roughly 96 percent efficiency. Some of the very latest motors meet the IE4 standard, which specifies energy losses about 15 percent lower than those delivered by IE3 motors, and the more recent IE5 "ultra-premium efficiency" motor represents the highest level of efficiency that has been met by any current design.

## FIVE LEVELS OF MOTOR EFFICIENCY

International Efficiency (IE) standards stipulate the energy efficiency of low voltage AC motors. These IE codes serve as a reference for governments who specify the efficiency levels for their minimum energy performance standards (MEPS).

 IE1: Standard efficiency
 IE2: High efficiency
 IE3: Premium efficiency
 IE4: Super premium efficiency
 IE5: Ultra premium efficiency

Too many motors in use today do not meet these standards and rely on older, IE1 or IE2 designs. It presents another challenge that many of these motors are over-dimensioned to the uses they serve. They frequently deliver much more power than required, which wastes energy. Considerable gains in efficiency may be achieved simply by deploying motors that are correctly dimensioned for the application in question.

Alongside induction motors, some highly efficient newer motor designs are establishing themselves as practical alternatives. Among these is the synchronous reluctance motor, which combines the performance of a permanent-magnet motor with the simplicity and servicefriendliness of an induction motor. Unlike permanent-magnet motors, synchronous reluctance motors do not require the use of rare-earthbased components. Instead, they achieve a maximized reluctance torque from a simple but robust rotor design.

Today these innovative motors are both practical and remarkably efficient, capable even of meeting the proposed IE5 target, first outlined in 2016. It is estimated that, if 80 percent of today's installed industrial motors were replaced with IE5 ultra-premium efficient motors, 160 terawatt-hours of energy per year would be saved, equivalent to more than the annual power consumption of Poland.

Even as the world seeks to increase energy efficiency in general, new applications have emerged that place a premium on efficient motor designs. This is certainly true of any application that relies on batteries to power a motor. A battery-powered automobile, for example, does not have the luxury of wasting power drawn from the grid but must be carefully designed to minimize consumption while maximizing the range and power available to the driver. This need is motivating a steady stream of new technological breakthroughs amid global growth in electric vehicle sales, a trend expected to continue.

State-of-the-art traction technology, energy storage systems and e-drivetrain solutions are now enabling an expanding array of emission-free transport options in the areas of rail, buses, heavy vehicles and marine vessels. Zero-emission boats and hybrid ferries are even beginning to make an appearance in the world's commercial waterways. New innovations in motor design have a major part to play in enabling the rapid uptake of all of these forms of electric mobility.

### A LOOK AHEAD

In next month's conclusion, we'll explore the underappreciated role of variable-speed drives in achieving greater energy efficiency on an industrial scale. Plus, we'll show how the impact of digitalization and connectivity have demonstrated potential benefits and the way forward as well as some successful recent projects around the globe and their impacts.

## .....

Morten Wierod is president of ABB Motion. ABB Motion keeps the world turning, while saving energy every day. Its pioneering drives, motors, generators, mechanical power transmission products, and integrated digital powertrain solutions are driving the low-carbon future for industries, cities, infrastructure, and transportation. Through our global presence ABB Motion is always close to its customers. For more information, visit www.abb.com.



SEALING SOLUTIONS



## **Types of Check Valves and Their Industrial Applications**

By Gilbert Welsford Jr., ValveMan

heck valves are indispensable safety components, used in industrial and residential piping systems to provide directional control of fluids. These valves are specifically designed to facilitate fluid flow in one direction, and restrict fluid flow in the opposite direction. Preventing fluid backflow protects critical piping equipment, such as pumps, from damage by pressure surges or hydraulic hammers.

Check valves are pressure sensitive devices that operate based on pressure differences, offering minimal resistance to upstream fluid flow, and closing when the pressure drops below cracking point (minimum upstream pressure). Check valves can close by means of the weight of their closing element responding to gravity, by the action of a return spring, or by a combination of both.

While directional fluid control is a straightforward process, selecting the appropriate type and size of the check valve is vital for satisfying the operational need of dispensing fluids safely. Below are some of the major types of check valves and their broad industrial applications categorized based on the mechanical movement of flow control members.

### SWING CHECK VALVE

A swing check valve utilizes a flap or disc that is of the same diameter as the pipe's bore. The flap is designed to offer minute resistance to the working medium, eliminating turbulent fluid flow. The flap is aptly hinged, so as to freely swing from the valve seat.

A tilting disc check valve is a modification of the conventional swing valve that has the flapper pivoted closer to its center, allowing the fluid to flow above and below the disc. Though the tilting disc check valves have higher resistance to fluid flow, they tend to open up at lower cracking pressures. Swing check valves have excellent sealing characteristics, with a compact structural design to ensure a shorter flapper stroke, limiting the valve's shutting impact.

Swing valves are predominantly used in domestic and industrial water supply pipelines, wastewater pumping systems and conveyance of industrial slurry. It is inadvisable to use swing check valves in pulsating or low-pressure flow media.

#### FOOT VALVES

The valves are designed for installation at the bottom, or at the inlet ports of multiple piping systems, and act as mechanisms that prevent gravitational backflows. The valve has a screen - or a filtration shield - that blocks debris and foreign matter from entering the upstream line. Foot valves feature wider inlet openings as compared to upstream pipes, in order to minimize pressure losses.

The strainer on the inlet side protects the valve and the piping system from frictional deterioration. Depending on the industrial application and nature of the working medium, it is vital for the strainer to possess adequate mesh sizes, which provide efficient filtration and are capable of preventing choking during suction.

Foot valves are commonly used with hydraulic and pneumatic pumps, intake pumps and sump pumps, wells, ponds, and pools.

#### DOUBLE DISC CHECK VALVE

Dual disc check valves are fast acting, self-actuating check valves designed with two centrally pivoted, semicircular discs. The valves are suitable for a wide range of fluids, application in chemical piping systems, fire protection utilities, and low-pressure portable water systems.

The dual discs are designed to work independently and feature a spring assisted pivot that keeps the valve on its seat. The semi-circular discs are lightweight and ideal for installation in tightly spaced piping systems. Dual disc check valves provide great hydrodynamic efficiency, limiting overall pressure losses. These valves have been designed to withstand extreme fluid pressure through the uniform distribution of stresses. Double disc valves have impressive non-slam and sealing characteristics. They are highly efficient valves whose operation is marked by low-pressure drops and by extension have nominal energy losses.

### **BALL CHECK VALVES**

These valves rely on a spherically shaped ball that moves up and down a conically shaped valve seat. The lateral motion of the ball from its seat occurs due to variations in fluid pressure. Ball check valves are essential for high-pressure piping systems that demand strict contamination controls.

The freely rotating ball is subjected to even wear and tear, making the valves suitable for the conveyance of viscous fluids. Ball check valves have been designed as self-cleaning and prevent the accumulation of trash. Though ball valves are cheaper and simpler in design, they require additional cushioning to protect them from slamming.

Ball valves are low maintenance valves that can be installed in vertical and horizontal orientations, with prime applications in the chemical industry for the conveyance of corrosive fluids and slurries, chemical storage facilities, metering pumps, and clean water supply systems.

#### SILENT AND RESTRICTOR CHECK VALVES

High-pressure shock waves place extreme stress on the pipes, increasing the susceptibility of the pipes to ruptures. The valves are primarily spring loaded, keeping the valves tightly seated. The silent and restrictor valves, usually referred to as non-slam valves are used to prevent hydraulic hammer for upstream axial flow. The valves open and close promptly, combating intermittent fluid shockwaves.

These valves are used in a variety of industries, including commercial gas transmission systems, water treatment plants, power generation utilities, textile manufacturing industries, and chemical processing plants.

### Y-TYPE CHECK VALVES

These valves are designed to provide easy maintenance without significantly affecting directional fluid flow. Y-type valves have spring loaded discs that move up and down the valve seat at an angle.

The valves offer the tiniest flow resistance when fully open and limit pressure drop in piping systems. Y-type valves are highly preferable for seasonal pipeline operations such as throttling during start-up.

The valves are predominantly used in high-pressure piping systems in chemical industries, power generation facilities, and wastewater piping systems, in which dirt periodically accumulates around valves.

## DIAPHRAGM CHECK VALVES

Diaphragm valves utilize a flexible rubber membrane that opens up when inlet pressure increases and overcomes the elasticity of the rubber. Unlike some other valve types, diaphragm valves respond at minimal cracking pressures for their opening. As upstream fluid pressure rises, the diaphragm flexes increasingly, allowing more fluid to flow.

As back pressure builds up, the diaphragm is forced against its seat, blocking the reverse flow. The valves are commonly used in low-pressure industrial piping systems and vacuum pipelines.  $\blacklozenge$ 

Gilbert Welsford Jr. is the founder of ValveMan.com and a third-generation valve entrepreneur. He has learned valves since a young age and has brought his entrepreneurial ingenuity to the family business in 2011 by creating the online valve store. Welsford's focus is building on the legacy his grandfather started, his father grew, and he has amplified.

## **Featured Product**

## GAS CLIP TECHNOLOGIES The External Pump

In nowing that the lives of many individuals across numerous industries depend on the accuracy and longevity of gas detection products, Gas Clip Technologies have spent over a decade specializing in gas detection solutions that are durable, compliance-based, and affordable all while utilizing cutting-edge technology. For example, they were the first to apply infrared technology to gas detection, which in turn made detectors safer due to their improved longevity and reliability. Such ideals have been at the heart of every Gas Clip product, and their newest addition—the External Pump—continues that tradition.

#### TAKING AIR SAMPLES

This accessory is a single-button motorized sampling pump that gives any Gas Clip diffusion detector—single gas and multi gas—the ability to take remote samples from up to 75 feet away, drawing air at 2 feet per second. The pump is equipped with a 10-foot hose for extracting air samples and a 3-foot hose to connect the pump to the user's detector. However, other hose lengths can be ordered separately. Also, like the MGC Pump, the External Pump is compatible with the MGC Pump Quick Disconnect (sold separately), which is an accessory that allows the user to effortlessly connect or disconnect a sampling hose to the pump.

### ALERTS AND BATTERY

Audio and visual alerts will inform the user of possible errors including blockages in the hoses and a low battery charge. The average continuous run time is fifty-two hours, and the pump requires four to six hours (typically) to recharge using the wall charger that is included with the purchase of the External Pump. However, the pump is also compatible with the MGC Vehicle Charger as well as the MGC Multi-Charger (both sold separately).



Gas Clip Technologies' The External Pump

### ERGONOMIC AND DURABLE

Additionally, the sleek, ergonomic design of the pump allows it to sit comfortably in the user's hand, which helps prevent potential drops. However, an alligator clip allows the user to firmly attach the pump to their belt, jumpsuit, etc. as needed. Either way, if the device does take a tumble, the durable casing can withstand the fall as well as other harsh treatment in the most intense environments. The External Pump comes with a two-year warranty and is available for pre-order now. All of Gas Clip Technologies' products can be purchased through distributors worldwide.

For more information about the External Pump, gas detectors, or any of Gas Clip Technologies' many accessories, email info@gascliptech.com or call 972.775.7577.

#### **QED ENVIRONMENTAL SYSTEMS** AP4.5 Ultra AutoPump System

The AP4.5 Ultra AutoPump System design has increased clearance between the float, casing, and discharge tube. The AP4.5 Ultra AutoPump System has three times the clearance of regular pumps which enables it to deal with higher viscosities, greater concentrations of solids content and precipitates. In addition, the pump utilizes 316-grade stainless steel which resists corrosion even when exposed to harsh leachates and high temperatures. The AP4.5 Ultra AutoPump System features a fiberglass pump body, stainless steel pump ends, internal components, and fittings for tubes and hoses. For more information, visit www.gedenv.com.



### SUNDYNE ANSIMAG Pump

ANSIMAG pumps have been widely deployed in pharmaceutical-grade freeze drier applications used by several companies for vaccines, including COVID-19 vaccines. Freeze drier applications play a critical role in the storage and transportation of vaccines. Pharmaceutical freeze drying is a standard process used to stabilize vaccines and other biologicals, and it's also used to increase shelf life. ANSIMAG pumps are used to deliver various cooling mediums to lower product temperatures below freezing, and high-pressure vacuum technology extracts water, to preserve pharmaceutical products for storage and transport. For more information, visit www.sundyne.com/products/ansimag-pumps.

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### **INTELLITECH** i-FILL Pump

For pharmaceutical companies, Intellitech's sterile, single-use liquid measuring and dispensing system and kit, including i-FILL pump, eliminates the need to clean and sterilize equipment between batches. This eases production scale up and changeovers, and provides accurate, reliable liquid measurement. The single-use technology minimizes the risk of contamination by utilizing sterile, disposable fluid path components from product source to dispensing nozzle. Each kit is a complete unit containing intake and discharge tubing, check valves, complete pump parts and a dispensing tip/nozzle. For more information, call 866.434.5548, email sales@intellitech-inc.com, or visit www.intellitech-inc.com.

## Taking Steps to Save Regional Water Resources



## The Water Tower's Kristan VandenHeuvel on sustainability and innovation

B ased in Buford, Georgia, The Water Tower, a new water innovation hub, has released its Lake Lanier Watershed Five-Year Research Plan, with the goal to protect and improve a critical water supply for North Georgia and Metro Atlanta. Overall, the plan provides a multi-year roadmap of project concepts aimed to improve and protect the watershed. Kristan VandenHeuvel, The Water Tower's strategic director of research and engagement, recently stopped by MPT's podcast to share more details.

## **MPT:** Where did the idea for The Water Tower originate and what need is it looking to serve?

**Kristan VandenHeuvel:** The Water Tower is a new nonprofit organization, and we were born out of Gwinnett County Department of Water Resources. How it came to be is that our CEO, Melissa Meeker, and the previous and current director of Gwinnett County Department of Water Resources sat down and really looked at the challenges that utilities in the Southeast are facing today—everything from aging infrastructure, increased costs, water volatility—all of these different types of challenges.

What they realized what we needed was a holistic water management approach. So the answer to that was developed to develop a nonprofit organization, The Water Tower, that can bring together all these different types of organizations and stakeholders under one roof, with the right people and the right resources to provide an ecosystem of innovation for the benefit of the water industry.

Our mission at The Water Tower is to be a thriving ecosystem of water innovation, fueled by imagination, informed by research, and powered by pioneers. We're doing this through building a physical campus and a community of organizations, focused on our four key pillars. Those are applied research, technology innovation, workforce development, and community engagement. And the ultimate vision for The Water Tower is to be the go-to organization for all things water innovation, and especially helping small to medium utilities become more progressive, attract new workers, and become the leading edge of research and innovation.

### MPT: Why is the Lake Lanier Watershed so important to the region? What dangers could occur if it's not protected?

**Kristan VandenHeuvel:** In our region, Lake Lanier is used for everything from power generation, drinking water, navigation, recreation, fisheries, agriculture, pretty much everything you can think of. It's very important for this region, and communities around the lake rely on it for both discharge of treated wastewater and their water supply, which is called indirect potable reuse, and also known as potable reuse through reservoir augmentation. And because of this, Lake Lanier is such a critical resource, and it really requires careful planning and monitoring and protection.

However, organizations were often working in silos. There are multiple different organizations doing work on the lake. But there wasn't a centralized coordinated effort to really communicate between the organizations.

With support from the Gwinnett County Department of Water Resources, which helped fund the formation of this plan, the development process, we identified the need for a coordinated multiyear plan that would benefit all those stakeholders in the Lake Lanier Watershed, and really helped the area for generations to come.

To listen to an extended version of this interview, be sure to subscribe to MPT's podcast, The Efficiency Point.





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