Montague Water Pollution Control Facility

Location: Montague, MA
Startup Date: Primary Design – 1962, Secondary Design – 1979
Design Flow: 1.83 MGD
12 Month Rolling Average Flow: 0.75 MGD
Grade: 6
Type of facility: Conventional Activated Sludge

Process Description: Flow arrives to the Operations Building via gravity mains with 8 pump stations and 4 grinder pumps that serve the villages of Turners Falls, Montague City, Montague Center, Lake Pleasant, and the neighboring town of Gill. It goes through an aerated grit chamber and mechanical bar screen before flowing by gravity through four 34k gallon primary clarifiers. From the primaries, two screw pumps send the primary effluent to two 230k gallon aeration tanks at a higher elevation, and equipped with coarse bubble diffusers provided with air via one 50hp and two 100hp blowers. Secondary clarification takes place in two 50 ft. diameter clarifiers with the secondary effluent flowing into two 25k gallon chlorine contact chambers, where it is disinfected with chlorine gas before discharging into receiving waters.

Discharges To: Connecticut River. Sludge Handling: Gravity Thickener, Screen Press
Disposal: Dewatered sludge cake, hauled off site for incineration. Staff: 8 Total. 3 Admin, 1 Lab, 4 Operations.

Certified Operators: The Montague team includes 7 (two Grade 6, three Grade 5, one Grade 3, and one Grade 2) certified operators. In addition, operators have many different skill sets that enhance the operations of the facility, to include: a lead mechanic, a state licensed plumber, CDL/hoisting/OSHA Safety licensed operator, an operator with a Bachelors of Science in Biochemistry, and the Superintendent with a Bachelors of Science in Biological Sciences and a Master’s of Science in Public Health.

(continued on page 6)
Charlie Tyler Selected For WEF Fellows Award

Congratulations to MAWEA Secretary Charles Tyler, whose 40-year career includes providing countless hours of advice and technical assistance to wastewater professionals throughout New England. He was recognized as a WEF Fellow on Oct. 7 at the WEF Awards ceremony during WEFTEC Connect.

COVID 19 Virus Continues To Affect Wastewater Facilities

While it is now apparent that Operators are not catching COVID 19 from exposure to wastewater, contracting the virus due to exposure to infected co-workers is certainly a possibility. In Massachusetts there have been approximately 150,000 infections and 10,000 deaths from the virus. Wastewater facilities have responded by requiring face coverings, practicing social distancing, reducing lunch room occupancy, altering shifts, setting up wash stations, and requiring temperature monitoring and health certifications. It’s important to follow the procedure required at your facilities as water and wastewater services are essential services for the public health of our communities.

NEWEA & MAWEA ANNOUNCE VIRTUAL FACILITY TOUR

Tuesday December 1st, 2020 1:00 — 3:30 pm
Register at newea.org

Facility tour plus technical and equipment presentations. 2.5 TCH’s awarded for attendance.

Uxbridge recently went through a whole facility upgrade!
MAWEA Officers
John Downey Pres
Ben Smith Pres Elect
Vacant Vice President
Eric Smith Past President
Charles Tyler Secretary
John Murphy DEP Liaison
Rick Nash Treasurer
Mickey Nowak Exec Director
Michael Burke Director
Rob Delgado Director
Vacant Director
John DiGiacomo Director
Robert Greene Director
Landon Kendricks Director
Jennifer Lichtensteiger Director
Peter Lyons Director
Raymond Willis Director
Vacant Education Coordinator
Bob Greene Events Coordinator
Bob Mack Golf Committee
Email mawea1965@yahoo.com to contact

Tired of troublesome septic systems?
Get the Best
CRANE PUMPS & SYSTEMS
PRESSURE SEWER
Industry trusted manufacturer and advisor of Pressure Sewer designs that benefit the homeowner, builder/developer, and the environment.
Contact Williamson New England Pump & Motor today for more information.

I WANT EVERYONE to stay healthy.
Please wear a face covering.
NEIWPCC Remote Learning opportunities  NEIWPCC will be continuing our remote training for wastewater operators in 2021. Watch our training calendar for new opportunities. Efforts will continue to focus on essential training for those new to the field and seeking to take a licensing exam. Mini-class topics will be modules of our traditional multi-session municipal, industrial, and wastewater laboratory in-person classes. Additionally, continuing education opportunities for advanced operators will be available in 2021.

Operator Certification Exams – PSI (the contract testing agency for Massachusetts) began opening owned and operated third-party test sites on May 1, 2020. Sites will be opened where governmental entities within a state, city, or county allow. If a site is not opened, it will be reflected on the closed list found at https://www.psionline.com/openings. This list is being updated regularly and serves as the best reference for candidates and stakeholders. It is recommended that you call the selected testing location prior to your appointment to confirm access.

The 2020-2021 renewal cycle is well underway. Please be sure to start earning your Training Contact Hours as early as possible, as training opportunities have decreased due to the COVID-19 crisis. Remote learning has been trending and more online classes are being developed, but online classes are in shorter blocks than in-person training, so you will be required to take more of them to add up to the 20 hours required. A listing of all approved training can be found here: https://www.mass.gov/doc/wastewater-treatment-plant-certificate-program-ceu-given-by-and-course-name

Wastewater Changes

It is with mixed feelings that we announce that Mike Jennings has moved on from NEIWPCC. Mike’s contributions to the success of NEIWPCC’s training, especially the recent transition to remote learning, will be felt for years to come. We thank him for his more than two decades of dedicated effort and wish him success in his next adventure.

We are excited to tell you that Patty Chesebrough joined NEIWPCC in October as the Program Manager for training activities. She is eager to move NEIWPCC’s program forward as we continue to train environmental professionals in these uncertain times.

Welcome, Patty, and best wishes to Mike!  (continued on page 5)
For more COVID-19 information for drinking water and wastewater operators please visit: https://www.mass.gov/lists/covid-19-information-for-drinking-water-and-wastewater-operators

If you have any questions about certification, please contact Michelle Jenkins directly at the Massachusetts Certification Program at 978-349-2516, or by e-mail at mjenkins@neiwpcc.org.

The Technical Seminar on Title 5 Approved Technologies that was to originally take place on May 27, 2020 in Taunton, MA, will not take place in November 2020 as previously reported. Due to the situation with the coronavirus pandemic and its impact on access to in-person meeting limits we are unable to book the new Tech Seminar in 2020. Tentatively, it will be held in the same location in May 2021. As soon as the new Tech Seminar is determined, we will send out a blast with registration information.

**NEIWPCC Training Calendar:**
https://portal.neiwpcc.org/training-calendar.asp

**Trainers Wanted**

NEIWPCC is looking for industry experts to join our training team. Focus areas for which we are seeking trainers include but are not limited to municipal/industrial wastewater treatment, nutrients, laboratory, maintenance & repair, energy, safety, and developing topics such as emerging contaminants and resiliency. If you are interested in becoming a part-time or contract trainer for wastewater operators, please contact Training@neiwpcc.org for more information.

For more information or questions on NEIWPCC or the MWOT program, please contact us at training@neiwpcc.org or at (978) 323-7929.
Montague (continued from page 1)

Unique Features: The facility has two primary effluent screw pumps, which are enclosed and painted blue with white stripes. Passersby often relate the spinning striped pumps to water park slides. The facility also has a wet weather contact tank, which is engineered to chlorinate and bypass flows in excess of 4MGD.
Are you dealing with failing septic tanks? Is I&I from your existing sewer system eating up your budget? Do you have a sewer project with challenging terrain looming ahead? Get after it.

ALL-TERRAIN SEWER™ low pressure systems from E/One are significantly more affordable than conventional gravity sewers, safer than septic systems, and they’re a light touch on the land.

Plus, our ALL-TERRAIN SEWER low pressure systems carry a proven track record of reliability with the lowest system life-cycle costs in the industry.

Whether it’s dead or dying septic tanks or expensive inflow and infiltration, we can help. Learn more at allterrainsewer.com

Don’t let your investment float away.

Make your next E/One® installation an easy one with BAL-LAST Interlocking Ballast Systems.

interlockingballast.com
PFAS Testing at Wastewater Facilities in Latest Draft NPDES Permits

From a recent EPA presentation:

• Draft EPA NPDES permits for Massachusetts will require PFAS monitoring of influent, effluent and biosolids after methods are developed by ORD

• EPA has released five municipal permits with PFAS monitoring. The draft permits are available at: https://www.epa.gov/npdes-permits/massachusetts-draft-individual-npdes-permits

• POTW influent, effluent and biosolids are to be monitored for PFAS (6 compounds including PFOA) quarterly

• The POTW will also be responsible for monitoring the effluent of its significant industrial users discharging to the collection system on an annual basis for those same 6 PFAS compounds

• These are monitoring only requirements without numerical limits and will take effect 6 months after EPA’s multi-lab validated method for wastewater and biosolids is made available to the public on EPA’s CWA methods program website

Neither the EPA or the MA DEP has chosen an approved testing method yet. The testing requirement in the new permits will take effect 180 days after an approved method is selected. Wastewater treatment processes do not utilize PFAS chemicals. Wastewater, septage, and biosolids receive and convey traces of PFAS that we use and encounter in our daily lives. Water Resource Recovery Facility (WRRF) managers need to have a master plan when it comes to how their facilities will manage their biosolids into the future. With all the uncertainties in the biosolids end-use markets due to PFAS, thinking long-term and having a plan and a back up is critical.
MAWEA Golf Outing Held on October 7th at Charlton

Seventy golfers from throughout New England Spent October 7th hitting and chasing a little white ball about the Heritage Country Club in Charlton MA. It was a lovely, sunny, scenic fall day in New England and a great day for a little socially distanced networking. A steak dinner and raffle featuring a 65” TV, an apple iPad, and Treehouse Beer Coolers followed golf. Prizes were awarded to the top teams, closest to the pin, and longest drive. Congratulations to all of the winners. Don’t forget to put next year’s date on your calendar—June 16, 2021.

Thank You to All of the Sponsors Below


Green Mountain Pipeline - Russell Resources

NEXT YEARS DATE IS JUNE 16, 2021!
Bye Bye Birdie
By Tim Loftus

It appears that later this year, if it has not already happened by the time this newsletter is published, we will be seeing a spike in COVID-19 related health issues. The fallout of this will also be job-related issues — shift changes again, probably more PPE and additional cleaning requirements. It is already stressful, and about to get more so. So, I will be changing direction here a bit. Lightening it up. Mickey, the editor-in-chief, said I can write about anything I want. While I will keep it about waste streams, this quarter I want to focus on bird droppings. Stay with me here, as it is actually quite interesting.

For years, those little brown birds used my car as daily target practice as they flew across the parking lot at the facility. No matter where I parked my car, they found it. Now I try to park between two tall SUVs, which has reduced my end-of-work shift car cleaning by 93%. As of this date, it takes a determined bird to desecrate my car.

This is what I've discovered since: while there are exceptions, for a bird's survival, they cannot retain liquid the way mammals can. Birds do not have a urinary bladder as the extra weight of retained liquid interferes with flight. Their liquid and solid disposal is part of the same combined system. Because of their internal biochemistry to make this function properly, birds do not produce pee containing urea or ammonia the way mammals do, instead they produce uric acid. That Rorschach Inkblot left on your car by a bird is made up of a green, black, or brown solid (excrement) and a white gelatinous substance of mostly uric acid. Uric acid does not dissolve well in water. It takes about 15 liters of water to dissolve 1 gram of uric acid. Similar with alcohol.

Washing your car with water or alcohol (windshield wiper fluid or even Windex) just does not work well. And the last thing you want to do is scrub it off your car, especially once the dropping has dried, as birds eat grit, mostly sand, to help digest their food. The grit in their waste can do a job on your car's paint when scrubbed. Instead, use WD-40. Spray it on, wait a minute, then gently wipe off. Water and baking soda (a base that neutralizes an acid) will work too. Do not use the old folk remedy of Coca Cola to clean the dropping off your car. It will work, but Coca Cola has a pH in the lower 2s from the phosphoric acid and will be just as bad for your car as the bird droppings, but without the looks.

Bird droppings, because they contain a lot of uric acid and are acidic (naturally), will degrade the wax and paint on your car. It will also degrade metal statues, pump housings (pigeons roosting in or around your pump stations?), concrete, and anything else where their abundant gifts are unwanted. Cleaning is good, but avoidance is better. Remove or create unfavorable roosting spots, cover equipment with plastic if appropriate, rent a cat, move your car, or pay the cost in money and annoyance.

The biochemistry of bird waste is fascinating, and I am only skimming the surface of the subject here. But at the end of the day, I really just want a clean car.

James “Jim” Legg, Town of Uxbridge, “Flowing” Off Into Retirement

By Benn S. Sherman, PE Director of Public Work

After 38+ years with the Town of Uxbridge, James “Jim” Legg retired from the Town of Uxbridge Department of Public Works Wastewater Division at the beginning of September. During his tenure, Jim served the Town in a number of capacities ranging from wastewater operator, chief operator and most recently as wastewater supervisor, where he oversaw our most critical operations and management processes. He was also involved outside the DPW holding other positions such as union chairman, insurance advisory committee, charter review committee, and most recently the wastewater building committee. During the past few years, Jim’s role transitioned into something more like a “consultant” during the $44.8 million upgrade of the 40 year old treatment facility. His institutional knowledge proved to be invaluable as we traversed our way through new permit limits, administrative consent order compliance and the daily grind of construction activities.

Jim’s vision played a critical role in further developing of the Wastewater Division. His commitment to the Department resulted in the USEPA awarding the Wastewater Division the 2012 WWTP O&M Excellence Award. His dedication to the Department didn’t stop there. Over the past 7+ years, he invested heavily in the division through developing and mentoring the young Wastewater Division staff to take over the reins when he retired. He accomplished this by encouraging staff to expand their certifications and licensing, as well as expanding their leadership skills through the NEWIPCC Management Training program. In 2018, Jim was recognized by NEWEA with the Alfred E. Peloquin award for his personal service and contributions to the excellence in plant operations and mentoring to plant operations personnel.

Jim’s contributions to the Town of Uxbridge over the past 38 years will not be forgotten. His work ethic, command of complexity, and devotion to the common goal has been outstanding and his influence has made an indelible impact on the new generation of wastewater operators. I want to personally thank Jim for all he’s done for the DPW and Wastewater Division and wish him well on his retirement.

Bye Bye Birdie
Carbon’s Role in Nutrient Removal
By: Brendan Luther

At the headwaters of the Blackstone River, which flows from Massachusetts, through Rhode Island and into Narragansett Bay, sits the Upper Blackstone Clean Water treatment facility. The municipal treatment plant services the greater Worcester area and receives an average 30 million gallons per day. The plant was one of the first in the state required to meet stringent regulations for total Nitrogen and Phosphorous. Like many states on the eastern seaboard, the Commonwealth of Massachusetts regulates effluent quality for point source discharges like wastewater treatment plants. If these treatment plants discharge to fragile waterbodies or those that already have already experienced environmental degradation due to excessive nutrient loading, they often must meet more stringent nutrient limits to maintain environmental health. In 2015, in an effort to optimize existing infrastructure to address the nutrient limits, Upper Blackstone began a pilot study with Environmental Operating Solutions, Inc. focusing on the addition of MicroC® 2000. This glycerin-based carbon source was to be used to enhance the biological treatment process to potentially eliminate the need for large capital expenditures.

For those not intimately in tune with Biological Nutrient Removal processes, voluntarily adding a carbon substrate, typically represented indirectly as Biological Oxygen Demand (BOD), seems puzzling. Is not one of the main purposes of a treatment plant to remove said BOD? Well, for low total nitrogen limits and some other key wastewater processes, adding supplemental carbon to a plant’s biological process is often not only of benefit, but a necessity.

If a plant that is designed for denitrification has a higher than desired effluent Nitrate or Nitrite (together known as NOx), there are usually two immediate culprits in the plant’s anoxic zone(s): lack of food availability and poor environmental conditions. Given the correct anoxic conditions and readily available carbon, denitrification will take place at a much faster rate than nitrification. If the zone is well mixed, and anoxic conditions with limited DO concentrations are present, but effluent NOx is high, the problem usually lies with a lack of readily biodegradable carbon. For plants that have a post-anoxic zone, as found in a 4 or 5 Stage Bardenpho process, the issue is fairly obvious; almost all the carbon has been removed in the aeration stage preceding it and therefore a supplemental carbon source must be added. However, for plants with only a pre-anoxic zone such as Upper Blackstone’s A2O process (Figure 1), where the NOx produced in the aeration zone is returned to the front of the plant to be mixed with the plant’s influent carbon, the issue is likely less obvious. Often the use of supplemental carbon comes into play when either a plant has a change in the ratio of carbon to nitrogen entering the plant, or, as in the case of Upper Blackstone, a permit requirement more stringent than what a plant was originally designed to meet.

High quality supplemental carbon can be used successfully for any wastewater plant designed for denitrification, from a 5 Stage Bardenpho activated sludge plant to a tertiary fixed film processes, like a deep bed filter. Likewise, it can be used for other biological processes or drivers other than denitrification. The bugs responsible for the Enhanced Biological Phosphorous Removal (EBPR) process also require carbon of a specific kind known as a Volatile Fatty Acid (VFA). If a plant’s EBPR process is lacking this type of carbon, the addition of either Acetic Acid or a Glycerin-based Carbon source is likely required. Another common application of supplemental carbon occurs when plants see significant decreases in their influent load over long periods of time.

(continued on page 14)
The successful pilot was converted to a permanent storage and feed system in 2019. and a strong foundation in biological nutrient removal knowledge to optimize the process and address their stringent Total Ni.

On the heels of one construction upgrade and faced with a new lower Total Nitrogen limit, Upper Blackstone needed a solution. This is typically seen in places with intense seasonal variation like ski resorts or when industrial processes are temporarily taken offline. These facilities will often feed supplemental carbon to keep their biomass alive in the interim.

For wastewater applications, supplemental carbon can come in many forms but the most common are methanol or glycerin-based carbon sources (e.g. MicroC® 2000). Each source has its pros and cons. Methanol for instance, is a widely used, high quality product that is inexpensive on a per gallon basis. However, methanol requires a long biological acclimation period and must be stored with care. Methanol is also hazardous and highly flammable. The additional safety requirements and large capital expenditures for explosion proof tanks/equipment may negate much of the product cost savings for medium to small sized wastewater plants. Glycerin-based carbon sources are typically non-hazardous, require no biological acclimation period (an important consideration for plants that won’t feed continuously), and have the added benefit that they can be used to enhance biological phosphorous removal. Glycerin also has its downsides. It is more expensive than methanol on a per gallon basis and if not from a reputable manufacturer, can have product quality issues that may plug up tanks and feed lines. From time to time a plant that mixes sugar water on site or uses acetic acid for biological phosphorous removal can be found, but the former is onerous to mix and attracts bugs, and the latter is typically very expensive. In both cases these plants typically would be better suited with a methanol or glycerin-based carbon source, and on a lifecycle cost basis when planned before tank construction, often specifically glycerin.

These facilities will often feed supplemental carbon to keep their biomass alive in the interim.

For wastewater applications, supplemental carbon can come in many forms but the most common are methanol or glycerin-based carbon sources (e.g. MicroC® 2000). Each source has its pros and cons. Methanol for instance, is a widely used, high quality product that is inexpensive on a per gallon basis. However, methanol requires a long biological acclimation period and must be stored with care. Methanol is also hazardous and highly flammable. The additional safety requirements and large capital expenditures for explosion proof tanks/equipment may negate much of the product cost savings for medium to small sized wastewater plants. Glycerin-based carbon sources are typically non-hazardous, require no biological acclimation period (an important consideration for plants that won’t feed continuously), and have the added benefit that they can be used to enhance biological phosphorous removal. Glycerin also has its downsides. It is more expensive than methanol on a per gallon basis and if not from a reputable manufacturer, can have product quality issues that may plug up tanks and feed lines. From time to time a plant that mixes sugar water on site or uses acetic acid for biological phosphorous removal can be found, but the former is onerous to mix and attracts bugs, and the latter is typically very expensive. In both cases these plants typically would be better suited with a methanol or glycerin-based carbon source, and on a lifecycle cost basis when planned before tank construction, often specifically glycerin.

On the heels of one construction upgrade and faced with a new lower Total Nitrogen limit, Upper Blackstone needed a solution that prevented an immediate second capital upgrade. Plants possessing only a pre-anoxic zone, such as Upper Blackstone’s A2O configuration, are typically designed to meet Total Nitrogen Limits of no less than 7 mg/L (Metcalf and Eddy 2003). The plant’s TN limit is 5 mg/L, and their target effluent concentration would need to be a healthy margin below that. Without an explosion proof storage and feed system on site, the plant managers and engineers at Upper Blackstone chose to pilot MicroC® 2000 to address their new limit. For the pilot, the MicroC® was dosed at the beginning of the anoxic zone in each of the plant’s four trains. The carbon dosing was controlled via a Nitrack® automated controller, to provide additional soluble and readily biodegradable carbon by the most efficient means. The dissolved oxygen set point was also tapered in the aeration zone to reduce the oxygen load recycled back into the anoxic zones. These process changes in concert drove the denitrification rate well below that which was possible with the A2O process configuration and good BNR practices alone. Since the end of the pilot period, Upper Blackstone’s operations staff have been able to use the tools of supplemental carbon, automated dosing control, and a strong foundation in biological nutrient removal knowledge to optimize the process and address their stringent Total Nitrogen limit. The successful pilot was converted to a permanent storage and feed system in 2019.

Air Bearing Versus Magnetic Bearings In High-Speed Turbo Blowers
By Matt DeLuca Aqua Solutions

When it comes to the challenge of running high-speed turbo blowers at 40,000 rpm in the unforgiving environment of a wastewater treatment plant (WWTP), robust design goes a long way toward accommodating extreme physical demands with minimal maintenance and overhead costs.

Familiar Physics, Without The Stress

Several non-contact bearing designs support the high-speed rotation of turbo blowers that satisfy the aeration demands in municipal wastewater treatment plants. These include magnetic bearings and air bearings. Both suspend a rotating blower shaft without the friction that would compromise conventional rotating bearings that are designed for lower-speed equipment. But each of those noncontact bearing designs achieves its performance in different way, with each having specific impacts on physical performance and cost. Air bearings operate along the same principle as oil-flooded bearings. Instead of trapping a thin film of oil, they trap a thin film of air between the shaft and a coated top foil supported by a corrugated bump foil layer in the bearing journal. At high speeds, that film of air creates lift and separation between the shaft and the top foil surface, suspending the rotating shaft without physical contact. No other components are needed, and physical wear is minimal.

Active vs. Passive Designs

As a “passive” design, the air bearing has only one moving part — the rotating shaft. On start-up, the high-speed rotating shaft motion instantly draws a thin film of air into the bearing body to levitate the shaft in a fraction of a second. The suspended shaft creates virtually no wear during operation. The air bearing’s stationary polytetrafluoroethylene (PTFE)-coated lining resists friction and wear with minimal contact at start-up and only a couple of seconds of contact on shut-down. As a result, simple bearing replacement projected on a 10-year design life is the air bearing’s only maintenance requirement. In contrast to air bearings, magnetic bearings feature an “active” design that requires offsetting magnetic forces to suspend the rotating blower shaft within the bearing body. This design requires more active components and more maintenance to achieve non-contact performance. The backup mechanical bearings, electromagnets, sensors, controllers, and battery backup systems needed to support the shaft at rest and in motion introduce an added element of sensitive electronic control in the harsh wastewater treatment environment. Those components also involve greater maintenance downtime and greater replacement costs than air bearings require.

Near Effortless Reliability

Despite their compact size and simplicity, air bearings offer a robust solution for reliable turbo blower performance in generating the airflow needed to meet biochemical/biological oxygen demand (BOD) requirements in WWTPs. Operating at full speed, they can support loads up to 600 psi. For efficient operation during periods of low-volume demand, they also permit high-speed turbo blowers to be throttled back as low as 10,000 rpm to adjust to low BOD requirements. This saves on energy costs while maintaining optimum blower throughput and long-lasting performance. Unlike magnetic bearings that are sensitive to heat and corrosion in WWTP environments, air bearings perform with minimal mechanical demands. They avoid the complexity of moving parts, electronic sensitivity, and the battery backup and mechanical bearing backup required by magnetic bearings in the event of a loss of power. Current advances in air bearings for high-speed turbo blowers include the ability to support blowers rated up to 400 HP.

Air Bearing Components

Turbo Blower Components
HOW EFFICIENT IS YOUR AERATION PROCESS?

LET’S TALK

Tom McCurdy, Director of Environmental Sales
+1 610 656 1683  tmccurdy@aerzenusa.com

Real efficiency means operating the consumption profiles in wastewater treatment plants with precision. Aeration consumes up to 80% of total energy requirements, the greatest savings potential can therefore be found here.

With our Performance³ product portfolio consisting of Blower, Hybrid, and Turbo technologies, we always find the most efficient and tailor-made solution for you. Benefit from up to 30% energy savings!

LET’S TALK! We’ll be happy to advise you!

www.aerzen.com/en-us