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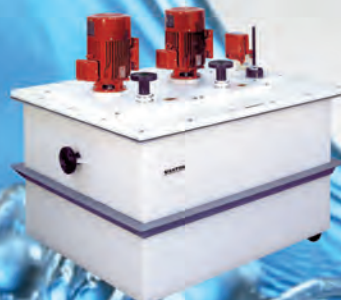


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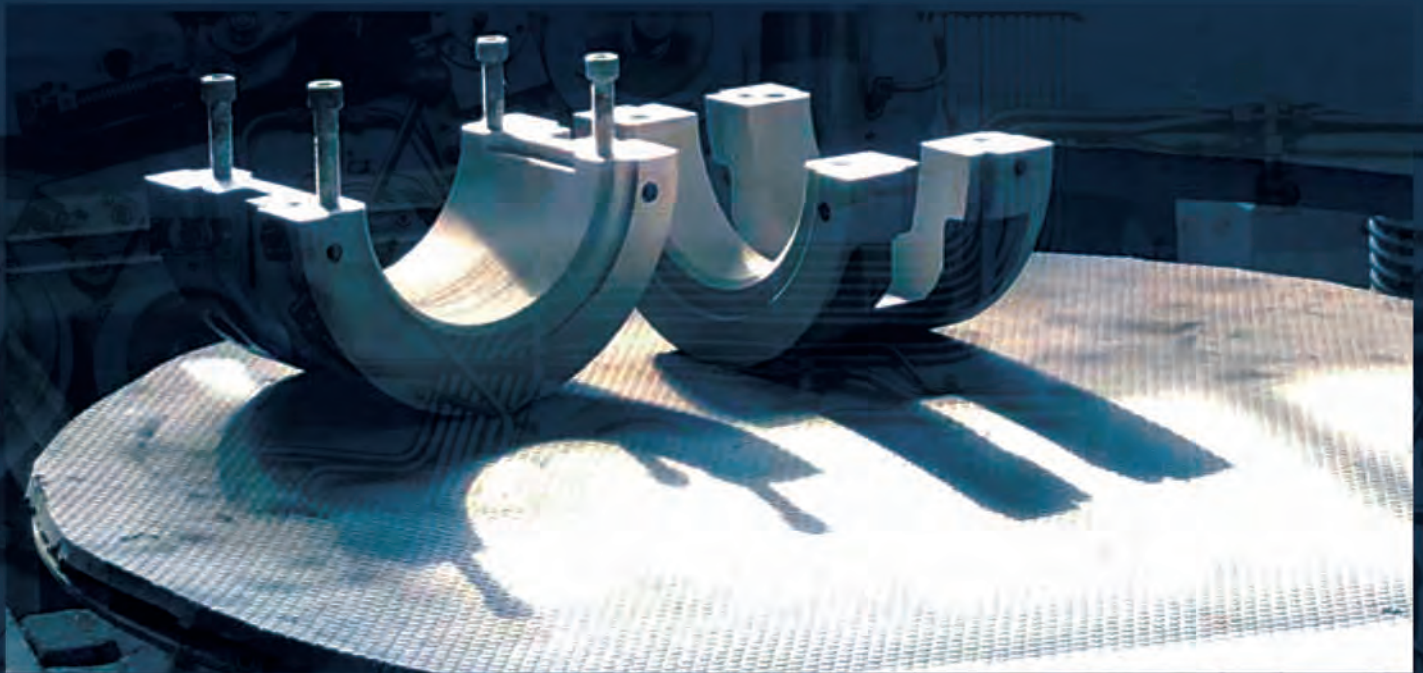
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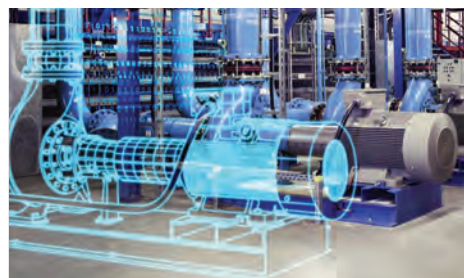
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WATER TREATMENT CHEMICALS MARKET TO GROW TO \$43.9 BILLION

The Global Water Treatment Chemicals Market is projected to grow from \$36.7 billion in 2023 and is projected to reach \$43.9 billion by 2028 per the recent study by MarketsandMarkets. Increasing demand for chemically treated water in various end-use industries and stringent water and wastewater regulations will propel water treatment chemicals market growth during the forecast period.

On the basis of application, raw water treatment is expected to lead the market in 2023, due to a confluence of critical factors. As the world handles mounting concerns about water quality and scarcity, the treatment of untreated water sources is taking center stage. Municipalities and industries are increasingly focusing on ensuring clean and safe drinking water supplies, in light of rising pollution levels, climate-related challenges, and stringent regulatory standards.

Furthermore, industrial processes heavily rely on raw water, necessitating effective treatment solutions to meet environmental sustainability goals and maintain operational efficiency. The growing awareness of waterborne diseases and contaminants further underscores the vital role of raw water treatment, making it a top priority for health and environmental well-being.

AEXEA CAPITAL LAUNCHES INITIATIVE TO REVITALIZE AMERICAN MANUFACTURING

aeXea Capital announces an ambitious initiative aimed at revitalizing American manufacturing small businesses. This strategic campaign focuses on companies, especially those established by the baby boomer generation, confronting challenges such as financial constraints, operational inefficiencies, or succession concerns.

"Our vision is to rejuvenate the manufacturing sector, which has been the backbone of the American economy for decades," says CEO Marek Niedzwiedz. "Our goal is to preserve the legacy of these small businesses, ensuring they continue to thrive in the modern, changing economy."

With a history of successful business acquisitions and turnarounds, Niedzwiedz is not only looking to acquire businesses but also to infuse them with new life, emphasizing job security and community value. "It's a comprehensive strategy that extends beyond financial investment," he adds. "We aim to instill a renewed sense of purpose and direction in these enterprises."

This campaign also seeks to create a ripple effect of positive change, extending beyond the immediate businesses. aeXea Capital's initiative represents more than a mere business transaction; it is a commitment to the economic health and technological advancement.

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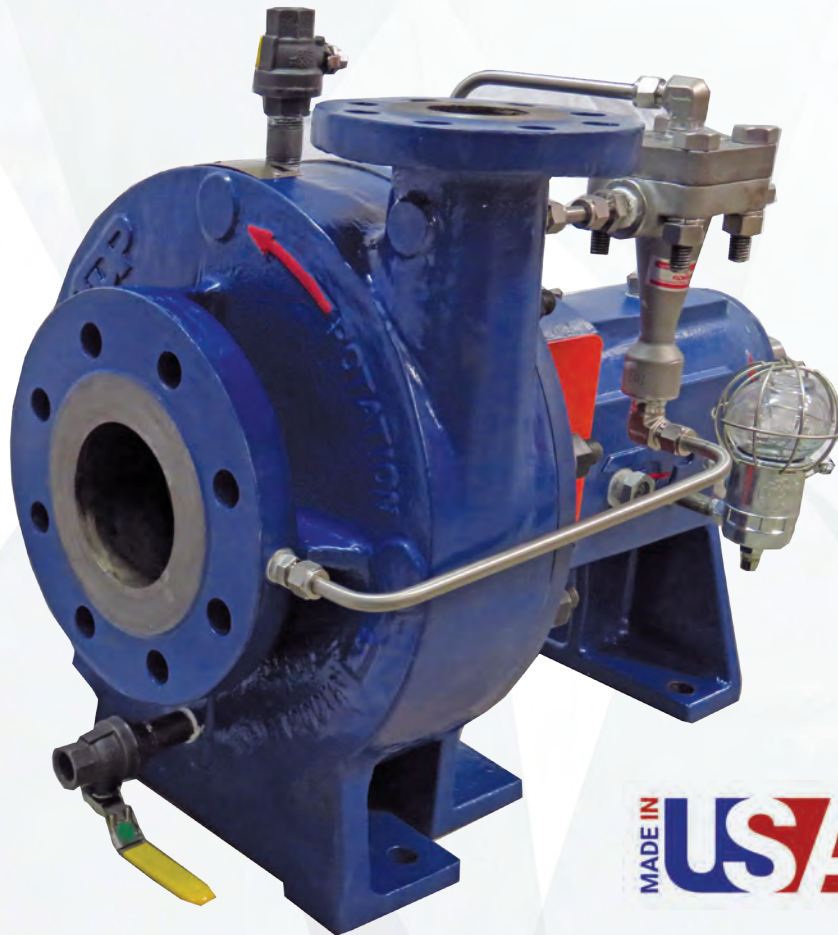


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NETZSCH HIGHLIGHTS PUMPING SOLUTIONS FOR LITHIUM BATTERY MANUFACTURING

Netzsch Pumps USA is highlighting its complex fluid pumping solutions that are ideal for lithium battery manufacturing at the Advanced Automotive Battery Conference. Both the Nemo and Peripro pumps have the ability to transfer complex slurry fluids and provide accurate metered flows of viscous, shear sensitive, and high solids laden materials which makes them well suited for lithium battery production. Netzsch Nemo progressing cavity pumps are a viable solution for the battery manufacturing process and the standard in the industry because of their advanced capabilities. They can convey this industry's wide range of abrasive slurries and harsh fluids without pulsation and meter them with extremely high precision. No metal-to-metal contact of the pump's wetted parts and lubrication-free flexible shaft options ensure no contamination of the products. These powerful pumps can also operate at slow speeds supplying very steady, low flows. Nemo pumps can be provided with many different materials of construction including abrasion resistant hardened steel, ceramic rotors, and one of over thirty stator elastomers. Netzsch formulates the elastomer compounds in-house to best withstand all of the harsh chemicals and solvents in the liquids.

NAIROBI WATER PROJECT TOPS FAN VOTE IN XYLEM'S 2023 WATER HEROES ACADEMY'

Against a backdrop of escalating global water challenges, young leaders are stepping up to make a difference with the Water Heroes Academy—a joint initiative by Manchester City's global community program, Cityzens Giving, and global water technology partner, Xylem. Launched in 2021, the initiative empowers young leaders to tackle water challenges in their local communities by using the power of football to provide essential education on water, sanitation, and hygiene.

This year, five water projects led by inspiring young leaders across the globe took part in the program. Earlier this month, Manchester City supporters were invited to vote for their favorite project, and with almost 18,000 votes cast, Nairobi was named the winning project for 2023.

It is estimated that 70 percent of Nairobi's population live in informal settlements, with only 20 percent having access to piped water and sanitation. The Nairobi team's project focused on educating young girls about using clean water for sanitation and hygiene during their period. The young leaders from Nairobi will be visited by a Manchester City Club Legend and receive additional training from team coaches.

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And to make it even easier, the XFP is available with a wide range of competitor retrofitting solutions for drop-in replacements, saving time and costly rehabilitation of a pump station. From retrofit brackets to controls to custom solutions, Sulzer makes it easy to get what you want. Don't you think it's time for change?



NIDEC SHARES MOTOR/CONTROL EXPERTISE AT 2023 GROUNDWATER WEEK

With more than 100 years of experience serving the groundwater and irrigation industries, experts at Nidec Motor Corporation placed a focus on groundwater professionals at its booth at National Groundwater Week to discuss trends and best practices for this evolving industry. Nidec is featuring two product lines used in groundwater applications, U.S. Motors and Control Techniques.

In addition to Nidec experts sharing information at the company's booth, Patrick Hogg of Nidec is leading a workshop on how to navigate the intricacies of the Build America, Buy America Act (part of the Infrastructure Investment and Jobs Act). Attendees can learn about compliance guidelines, unresolved aspects of the Act, and the importance of pinpointing one's position in the supply chain.

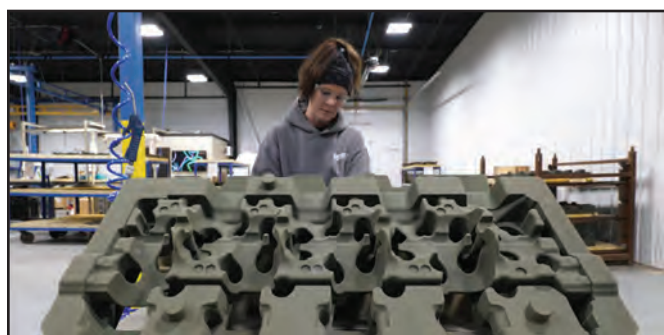
At the Nidec booth, the vertical Holloshaft from U.S. Motors will be prominently featured. This motor line has been setting the standard for the vertical turbine pump industry since its invention in 1922. Known for longevity, reliability, and ease of use, the Holloshaft and solid shaft pump motors can be configured to exact vertical motor application requirements. Nidec plans on building momentum out of National Groundwater Week for the coming year in this important sector of the industry.

USAF SELECTS WOOLPERT FOR SUPPLY CHAIN MANAGEMENT

Woolpert has been contracted by the U.S. Air Force to provide geospatial IT system support and management services for the Air Force Materiel Command's 448th Supply Chain Management Wing (SCMW). Under this yearlong contract, Woolpert will assist the SCMW, the Air Force Sustainment Center, and the AFMC in applying geospatial technologies to identify risks to the USAF supply chain and help mitigate the impacts of extreme weather events, natural hazards, and the potential long-term impacts of climate change.

Headquartered at Tinker Air Force Base near Oklahoma City, the 448 SCMW serves as the wholesale supply chain manager for the USAF. The wing is responsible for the planning and execution of spares requirements for USAF aircraft, engines, and air defense systems, as well as supply chain readiness to partner nations.

Woolpert will provide geospatial IT capability development, training, modernization, and sustainment services that will be leveraged by the SCMW in its management of USAF logistics. Woolpert's data analyses will help the USAF evaluate the level of danger that suppliers may be exposed to from external hazards. ■



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AHR EXPO

The essential event for HVACR professionals

The AHR Expo brings together manufacturers and suppliers of all sizes and specialties to share ideas and showcase the

future of HVACR technology. It's the industry's best place for OEMs, engineers, contractors, facility operators, architects, educators, and

other professionals to experience everything new in HVACR and build the vital relationships that grow businesses and careers. The AHR Expo is co-sponsored by ASHRAE and AHRI and is held concurrently with ASHRAE's Winter Conference.



The event for HVACR / Jan 22-24, 2024 ASHRAE AHRI

AT A GLANCE

WHEN: Jan. 22-24, 2024

WHERE: McCormick Place, Chicago, Illinois

WEBSITE: www.ahrexpo.com

THE PLACE FOR EDUCATION

Led by experts, the program features over 100 free sessions on today's best practices, industry trends, tips for improved ROI, and ways to boost your professional growth.

"The Education Program has grown into a true complementary asset to the show floor experience," says Show Manager Mark Stevens. "Inside exhibitor booths, manufacturers are displaying real solutions to



improve the health of the industry, the professional work experience and to address the shifts in our wider society. As a bridge to the robust activity on the floor and attendee understanding, the education program will offer real discussions about real problems that are shared across the industry. We're working to connect the varying sectors within our industry to deepen these conversations. By inviting our associations and community leaders to the table, we can spark important conversations that lead to smarter decision-making and customer engagement."

The AHR Expo Education Program will provide an understanding of real-world application and practice in areas of niche discipline, as well as a broader discussion of topics relating to trends happening currently and on the horizon within the industry. Workforce education and open-form communication is an important factor as developments occur across the industry.

"Our manufacturers do a phenomenal job of displaying everything new to the market," continues Stevens. "All the latest products and technologies, as well as solutions to nearly any issue attendees may encounter in their day-to-day professional HVACR efforts are there. The education program adds

an added layer of understanding and knowledge building that supports what our manufacturers are bringing to market, and how professionals can work together to identify solutions throughout the full project cycle." Attendees can expect the program to address a wide variety of topics

THE PLACE FOR INNOVATION

AHR Expo also leads the industry in recognizing new approaches and technology. The AHR Expo Innovation Awards winners are chosen annually in ten industry categories, representing the most innovative products and technologies in the market.

"There's no shortage of innovation in HVACR right now," says Stevens. "To be recognized as an award winner is a true honor and an indication that we as an industry are responding to real problems with creative solutions. The Innovation Awards aim to highlight this innovation trajectory and celebrate those that are pushing the bar."

The Innovation Awards draw hundreds of manufacturers to enter breakthrough designs for new and never before seen solutions or improvements upon existing products and technologies. All entries are reviewed and selected by a panel of third-party judges made up of distinguished ASHRAE members.

Evaluations are based on overall innovative design, creativity of the product or service offered, product or technology real-world application, as well as overall potential market impact.

"It's encouraging to see so many entries and the growth the awards program brings year to year," continues Stevens. "Manufacturers across the industry are responding with solutions for cost savings, energy savings, production efficiency, and are filling performance gaps in product and technology. Congratulations to our 2024 winners, we look forward to supporting your journey of innovation in Chicago and beyond!"

THE PLACE TO BE, NOW AND TOMORROW

In addition to celebrating education and innovation in HVACR, AHR Expo provides a means to strengthen the industry by allowing for the AHR Expo Workforce Development program, which aims to grow the industry through programming geared to inspire future members of the HVACR community. Funds collected from the entry fees are donated to programming at the student level, including show field trips, curated introductions to professionals and manufacturers, laboratory equipment, and monetary donation to student programs in the hosting city. ■

CREATING EFFICIENCY WITH OPERATIONAL TRANSPARENCY

California community builds benefits with new operational management software

BY TRENT KAMINS, AQUATIC INFORMATICS



Sedaru and Wachs valve exercising machine work together to eliminate operator error.

Channel Islands Beach Community Services District provides water, sanitation, and garbage collection services to approximately 10,000 people in the Channel Islands Harbor area. The community's infrastructure was laid in the 1960s so much of it is nearing the end of its life expectancy. Roughly 80 percent of the district's water comes from local groundwater sources and about 20 percent is brought in through the Metropolitan Water District, which is helpful in times of drought, but more costly. Ensuring the water distribution system is in optimal working order minimizes water loss and helps with water conservation efforts to keep rates low for residents.

GETTING MODERN WITH DATA

Pre-pandemic, the district recognized the need to improve its asset management and move away from paper "fix it" notes, to an actual software program that accounted for all assets in one platform and had the capability of managing day to day operations. With a recorded account of the state of all assets, the district would be able to use the data to address urgent needs, plan for regular maintenance, and forecast replacement projects.

Peter Martinez, the general manager for Channel Islands Beach Community Services District, oversees a staff of eight people. Martinez says, "For a small office like ours, we need to be as efficient as possible. If we can automate reports and schedule and track field work while

sharing information in real time, we can get more done. Like any utility, we also need data to make the best decisions for infrastructure upgrades and replacement, and that's hard to gather from paper records. There's a lot to address when it comes to aging infrastructure and it was clear we needed a good operational management program to help us prioritize maintenance and spending to best serve our ratepayers."

The district chose Sedaru, a utility operational management platform by Aquatic Informatics. Jesus Navarro, operations manager with the district says, "Today, people use intuitive software in their daily life, so if it feels like you need to be a software engineer to operate an office program, it's going to be very hard to get staff on board. We chose Sedaru because it is easy for everyone to use, and the benefits are clear to see. Staff buy-in is crucial to a successful software deployment so we set up lunch and learns that allowed

people to play around with it and ask questions. This was very successful."

TRANSPARENCY ACROSS THE BOARD

Deploying the new software before the pandemic shutdown slowed the speed at which new programs were added to the platform, but on the flip side, it gave the district the ability to run operations remotely. Work orders were dispatched, completed, and recorded through the platform, allowing staff to continue efficiently performing their roles. "We never had this kind of transparency across the board. Without this, many staff would have been in the dark," says Martinez.

Today, the district runs several asset management programs through the platform, including hydrants, water sampling stations, pipes, valves, lift stations, smart meters, and more. When the fire hydrant maintenance program was first input into the platform, it identified a few hydrants as inoperable. With this

knowledge, the district was able to prioritize and replace the hydrants in-house.

Field crews record work performed while in the field, record information like static pressure and can update missing information and add pictures. "A picture can be worth a thousand words," says Navarro. "When you look at a photograph, you can often make better sense of what was done."

Now if a customer calls to complain about their water pressure, the front office staff simply click on the nearest hydrant and read the static pressure to determine if the problem is on the distribution line and needs to be checked out, or if it is a resident issue.

APPLICABLE BENEFITS

Water quality sampling is done by a third party that collects samples and provides the district with weekly lab results that are uploaded into Sedaru. "If a customer calls with a water quality concern, our front office staff can click on the nearest sample

Problem: storm event raises water level in local streams. Water flows back through drain pipe and floods underpass.



Solution: Onyx Duckbill Check Valve prevents stream water from flowing back into drainage systems.

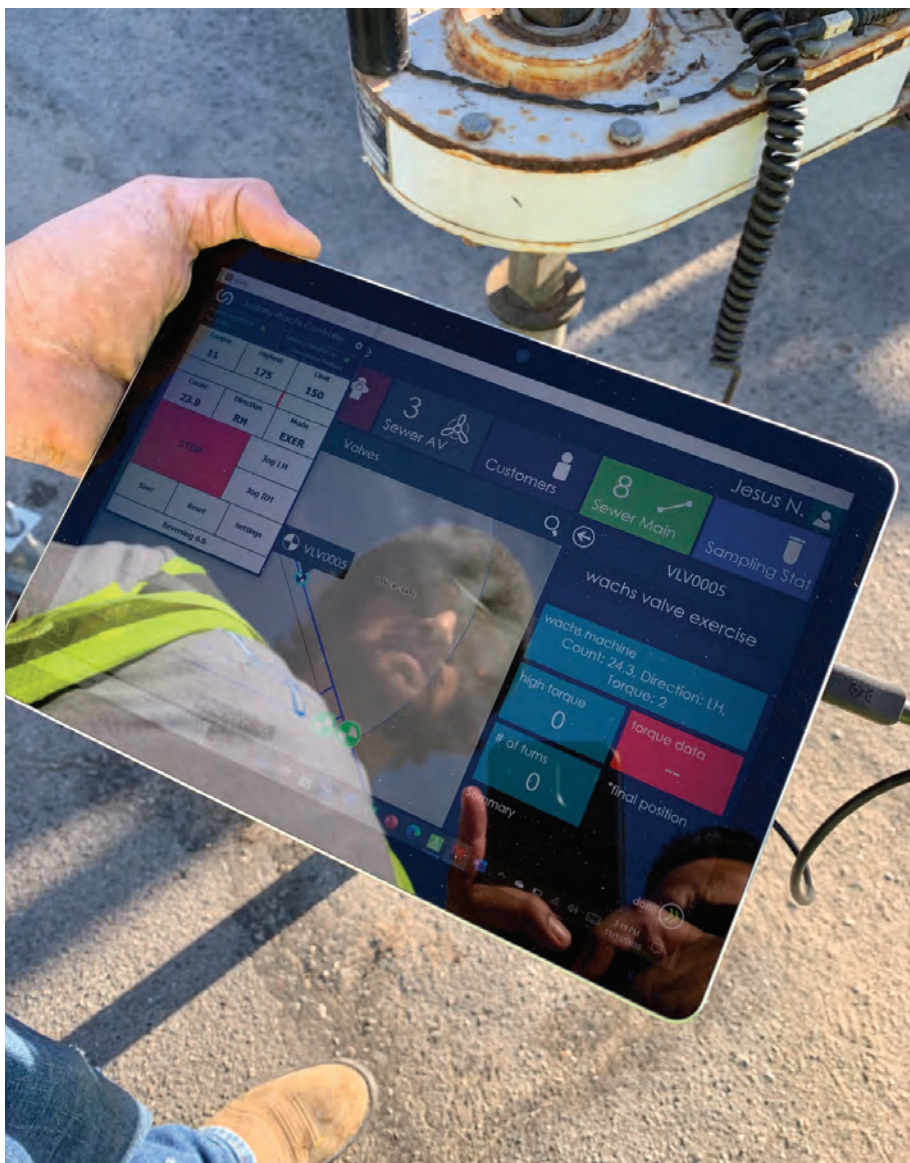


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CIBCSO runs several asset management programs through the Sedaru platform.

station and give the latest results. Tracking of this information also makes regulatory reporting much more efficient, and with customizable dashboards and selection criteria it is easier to identify areas that need changes in treatment regimens or flushing," says Martinez.

Prior to the new platform, there was no valve maintenance program. For the most part, valves are neatly tucked away and can continue to work uninterrupted for years if not decades, until something goes wrong. Most valve checks at the district were done based on staff knowledge based on years of experience. Now the district connects Sedaru directly to its

Wachs valve exercising machine and the work is automatically uploaded as it is performed.

"The field person just clicks on the asset hookup, and the machine records everything straight into Sedaru, including how many turns, how much torque it took, and so on," says Navarro. "These tools working together eliminate operator error. We now have accurate organized data, that makes it possible to generate reports with a couple of clicks and easily identify faulty valves for replacement. We have taken this data, and now have a board-approved valve replacement program, which would have been

very hard to justify without knowing what we now know."

A SMART SOLUTION

As the district moved to smart meters, field crews were able to complete the changeout work orders, input new serial information to be used for billing and add any specifics for future servicing. If a communication node stops working, Navarro can dispatch a work order to a field crew in the area to replace the node. By using a connected mobile device field crews have all the information at their fingertips and can complete the work order in the field and move on to the next task, without going back to the office to complete paperwork or pick up the next job.

"As time went on, we wanted to have the ability to have a 'follow up' feature as some meter work requires customer service staff to make other changes. For instance, if a house is knocked down and a new rebuild takes place, the resident may request a larger water service line, which then requires a different meter. These meters tend to be closer to the curb, which can lead to cars parking on top of the meters, so we need to make further adjustments. The Sedaru staff were able to add a 'follow up, feature quite easily and are very supportive in customizing features to improve workflow," says Navarro.

NOTHING SLIPS THROUGH THE CRACKS

Channel Islands Beach Community borders the Pacific Ocean and is surrounded by harbors, so it is vital that the district's sewer system is well maintained and monitored to ensure there is no spillage. The new platform runs a sewer lift station program that requires weekly maintenance along with monitoring of the sewer main line. The gravity sewer lines are on a two-year cycle, with some hot spots visually identified on maps that require a higher frequency of cleaning. Sewer wet wells are also scheduled in for a quarterly cleaning.

The new platform also manages work orders for anything relating to trash service, including delivery of new barrels, scheduling a special pickup, and routine changes in service.

Today field crews can look at Sedaru and see the whole day's work ahead. They can take the right tools and people to get the job done. If a new work order gets placed in priority, they can instantly see it and go straight to the site. Prior to this crews would come all the way back to the office once they completed a task. "Being a small community, we really value quick response times and our residents expect that high level of service, so anything we can do to improve efficiency makes everyone happier, especially the staff," says Martinez.

PREPARING FOR THE FUTURE

The district is already in the midst of addressing the aging workforce with Martinez and Navarro both new hires within the last four years. Moving from paper to digital has meant that the district is in a new phase of capturing information. In the last two years of deploying the new platform, the district has gathered a wealth of information that will be easily transferable to new hires. Martinez will be able to show the enormous amount of work that is done daily and the positive impact that is realized by this small community that literally has its finger on the pulse of every piece of infrastructure.

"What we really like about the platform is that it is dynamic. As we use the program more, we realize our needs are unique and we can customize features and dashboards to streamline our workflow. We know we will continue to change and improve, so having a solution that can adapt with us is key."

Martinez says, "The days of being subjective and shooting from the hip are over. The new platform has changed us from the Flintstones to the Jetsons. In another 10 months or so, we'll have a baseline of data to be able to set clear goals and measure performance." ■

TRENT KAMINS is account manager for Aquatic Informatics. He and his team help utilities become more proactive and improve operations, maintenance, and asset management with digital solutions. Aquatic Informatics provide ongoing support and training for newly released features through regular software updates, ensuring that utilities get the most out of their data with the constant evolution of technology. For more information, visit www.aquaticinformatics.com.



The advertisement features a dark background with a blue and white illustration of a pump system. The pump has two large vertical cylinders and a central mechanism with a circular component. The text "OverWatch®" is prominently displayed in white, with "Direct In-Line Pump System" in a smaller font below it. Below the pump illustration, the text "Watch the latest video" is written in orange. A circular QR code is located in the bottom left corner of the advertisement. In the bottom right corner, the "INDUSTRIAL FLOW SOLUTIONS™" logo is shown, consisting of an orange hexagonal icon and the text "INDUSTRIAL FLOW SOLUTIONS™". Below the logo, the website "www.flowsolutions.com" is listed.

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MAKING THE CHAMPIONSHIP SWITCH

Artisan cheesemaker reduces energy costs, optimizes operations, and ensures product integrity

BY RICK BALEK, WATSON-MARLOW FLUID TECHNOLOGY SOLUTIONS

When Greenfields Dairy Products Ltd needed to replace an aging pump from another supplier, the family-run cheesemaker contacted Watson-Marlow Fluid Technology Solutions (WMFTS) to discover its options. Greenfields, which specializes in the

craft of award-winning traditional cheese, decided to introduce a MasoSine Certa 400 pump from WMFTS into its operation which processes up to 10,000 liters of milk per batch of cheese.

The MasoSine Certa pump has improved reliability and yield in

Greenfields' cheese production, while also reducing energy at a time of rising costs.

MASOSINE CERTA PUMP

After adding the energy-efficient MasoSine Certa pump for the transfer of curds and whey across its facility in Lancashire, England, Greenfields won gold for several of its cheeses at the International Cheese Awards in the summer of 2022.

Steven Procter, managing director at Greenfields, says, "We had been using the same pump since 1985. We need a pump to transfer the curds and whey across the facility because we are on one level whereas a lot of cheese making facilities are on



PROJECT PROFILE

- Artisan cheese producer switches from centrifugal pump to MasoSine Certa 400 and wins international award
- Assurance of no damage to the product due to gentle pumping action
- Pump investment has led to better quality of cheese, improved yield, and expansion of lines

PARTNER PROFILE: GREENFIELDS DAIRY

Greenfields is a small, traditional cheesemaker, based in the Lancashire countryside, England. It is a family-run business with an award-winning track record in the craft of fine traditional cheesemaking. From the 1930s, the family recipes have been winning prizes at major trade events in England. For more information, visit www.greenfieldsdairy.co.uk.

different levels and can rely on gravity to transfer curds and whey. "It was a massive task to find a new pump and we looked at all the different types. It's a big investment for a company of our size and it only gets used for between one and four hours per week.

"It was all about the technology. It's a lot safer for us to use the MasoSine Certa because if you damage the product, it can lose yield and that could affect the quality and certainly our profitability. By using the MasoSine Certa, it has made our operation better and in terms of yield. If we were to damage the curds and whey, we would lose some of the solids, so we have to be gentle with the pumping."

HOW IT WORKS

"The MasoSine Certa works on a variable speed supply," adds Procter, "but we couldn't alter the speed of the previous pump. Now we can speed up or slow down the transfer of curds and whey with no damage. The clean-in-place (CIP) is brilliant too, it's really easy to use and is suitable for our business.



"We are only a small family business, and I would recommend the MasoSine Certa to other independent artisan cheesemakers because it's working for us. It should last for a lifetime and gives us an assurance of quality of product and reliability.

"We make about twenty-five different varieties of cheeses. We were winning awards for our cheese before we introduced the MasoSine Certa pump, and we have continued to win awards after installing the MasoSine Certa pump for our cheeses."

MEETING CUSTOMER NEEDS

Greenfields' continued success illustrates how MasoSine Certa pumps from WMFTS can be successfully utilized by independent, artisan, or farmhouse dairies, as well as the big producers.

The MasoSine Certa 400 offers greater energy efficiency over other pump technologies which gave Greenfields' added value and improved ROI. MasoSine pumps typically require up to 50 percent less power than conventional pumps used in viscous fluid handling duties.





Dave Cole, food and beverage sector specialist-north at WMFTS UK, adds, "When I first met Steven at Greenfields, he was looking to renew his equipment and it was evident he had already done his research and knew the technical benefits of our MasoSine Certa pump. His concerns were now around any product quality



impact the new pump would have on his proven artisan process, compared to his long-trusted existing equipment.

"Through Steven's own pump trials, our technical expertise to guide his final specification selection and our mutual understanding of his business needs, he gained the confidence to press ahead with his purchase of the MasoSine Certa 400."

THE MAKINGS OF A CHAMPION

In 2015 Greenfields won the Supreme Champion at the International Cheese Awards and seven years later won another award at the same event for its Crumbly Lancashire Cheese.

Greenfields produces a wide range of territorial and specialty cheeses all of which are produced from locally sourced milk, with over 20 different varieties.

WMFTS supplies pumping solutions to cheesemakers of all sizes. From producing 2,000-liter vat production rates through to over 100,000 ton of cheese per year from 830 million liters of milk, WMFTS has a solution to meet the needs of food and beverage manufacturers. ■

Watson-Marlow Fluid Technology Solutions (WMFTS) is a world leader in manufacturing niche peristaltic pumps and associated fluid path technologies for the life sciences and process industries. WMFTS is a wholly owned subsidiary of Spirax-Sarco Engineering plc, with operations in forty-three countries. For more information, visit www.wmfts.com.

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IT'S PERSONAL



With the high-speed washouts, the concrete plant can run fewer trucks with less labor and material handling while still delivering the same amount of material or more.

FASTER ONE-STOP CONCRETE WASHOUTS

With expedited reclamation process, drive up, dump, and drive away

BY DEL WILLIAMS

For ready-mixed concrete plants, any delay in washouts—whether due to truck operators driving long distances or the complexity of the process itself—can reduce productivity and profitability. After each delivery, washing out the trucks and equipment is essential to meet mix specifications, reclaim unused material, and keep equipment clean. Ideally, washouts should be

fast and efficient, with all reusable material reclaimed.

The challenge is that traditional washout techniques can be time-consuming and labor-intensive, often involving multiple steps. As a solution, industry innovators have created systems that dramatically streamline the washout process, which saves considerable time, labor, and money. These systems

can recover sand, stone, and cement for re-sale or re-use using recycled water in a closed-loop system.

The most advanced units allow a driver to complete a washout in minutes at a single onsite location without a washout pit, settling pond or presses of any sort. This keeps concrete trucks on the road making money, instead of wasting time on slow washouts.

"Altogether we are saving hundreds of thousands of dollars a year in driver's time, truck time, and trucking material using a modern washout system," says Frank Gelewski, Director of Operations at Fair Lawn, New Jersey-based Tanis Concrete, Inc., which services major highways, airports, and other state and municipal work throughout Northern New Jersey with three state-of-the-art concrete plants. "Our water usage is also way down because we are reusing it. We are not wasting water to wash out the trucks only to have it evaporate or hydrate into the ground."

COSTLY, INEFFICIENT WASTE MATERIAL HANDLING

For ready-mixed operations, the process of washing out concrete trucks and equipment is essential to reclaim unused material. It also prevents buildup on the equipment and makes meeting mix specifications easier. However, the typical practices employed are inefficient, as they

involve multiple processing and material handling steps.

The washout process typically involves using designated pits designed to receive washout water and material. Operators rinse and clean the concrete trucks and equipment using high-pressure water, allowing the excess concrete to wash into the pit. Once the concrete washout has settled to the bottom, the solid material can be removed and disposed of properly. Similarly, settling ponds allow suspended cementitious solids in washout wastewater to settle before further processing or disposal.

In the case of Tanis Concrete, the original process of getting washout water was slow. A concrete truck driver would take the vehicle to the plant water supply to fill tanks with water used to rinse out its mixing barrels. The operator would then drive to a washout pit and discharge the water and leftover materials into the pit.

Another concrete reclamation method, called concrete curing, involves spreading the leftover concrete on the ground. Once the concrete has dried and hardened to a certain extent, it is typically broken into manageable pieces using heavy machinery or equipment. Crushing machines then process the broken concrete pieces further for use as recycled aggregate. This material can sometimes be used as a substitute for natural aggregates in new concrete mixes or other construction applications.

In all these conventional methods of concrete reclamation, any travel to washout pits, settling ponds, or concrete curing sites is time that truck drivers are not making deliveries. The extra material handling steps slow the process, increase labor costs, add to equipment wear and tear, and reduce the plant's profitability.

In washout ponds and pits, the cost to replace make-up water, which is often purchased from a local utility

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With the sophisticated systems available today, plants can now complete washout and reclaim any leftover concrete materials faster and more profitably than ever before.



Expedited reclamation process can eliminate the need for pits, ponds, and multiple handling while providing total recovery of sand, aggregate, and cement.

or pumped from wells, can also add up quickly. The ponds and pits usually require continual maintenance to remain functional. Ponds typically need continual sludge cleanup. As pits fill with washout material, they need to be excavated and carted away to a facility that charges for recycling. A messy job that coats equipment with

cement and can cause serious maintenance headaches. Pond liners also can become torn and require additional maintenance to repair.

"About every three months we had to excavate the pit [of washout material], put it in a stockpile, and let it dry out. The material was mixed with clays, fines, stone, and hydrated cement. It was basically a useless product, so we had to pay to have it hauled away to a concrete recycling facility about 12 miles away. At the time, it cost about \$200 a load to dump the material, not counting the truck rental; today, it would cost about \$500 a load," says Gelewski.

According to Gelewski, the cost of water was also an issue. "We were using metered city water and had to pay for any wasted water. We were offering about twenty-five different concrete mixes, so the wasted water at the end of each quarter [when we paid our water bill] was excessive."

In addition, he notes that space was constrained with the onsite pit and stockpiles since Tanis Concrete operated on a one-and-a-half-acre site.

FASTER, MORE EFFICIENT WASHOUT

Rather than have concrete truck operators waste time driving to remote locations for washout, the machine is conveniently located at the plant. Concrete truck operators simply drive up, dump, and drive away. This one-stop approach allows for faster washing out of concrete trucks, which reduces downtime and increases productivity. The cumulative time savings across multiple drivers in an eight-hour workday can be substantial.

As an example, the Redi-Wash Washout System by Jadair does not require settling ponds, washout pits, or filter presses since it has a built-in water clarification capability, unlike traditional reclamation-only units.

Port Washington, WI-based Jadair International, Inc. is a provider of various solutions for the concrete industry including concrete reclaimers and water clarifiers. The company manufactures equipment for mobile and permanent installations in many sizes and configurations, and works with ready-mixed, precast, and other concrete producers.

The washout system provides concrete reclamation and water handling within one self-contained, closed-loop unit. The machine separates and discharges the sand and stone, which enables complete recovery of these items. Sand is not washed out of the aggregate. Spent cement is discharged separately and a loader can handle this cement easily as a dry, clay-like product. The water is directed into a separate area of the machine where it is clarified and reused for washouts.

To perform a washout, the driver simply backs up the concrete truck to the machine. The machine adds recycled water to the truck's rotating cylinder, which mixes the water with any remaining concrete for a couple of minutes. The truck then dumps the washout water and concrete into the machine, which processes and reclaims it.

After searching for a solution, Tanis Concrete installed a three-station, Jadair Redi-Wash Washout System that accommodates three trucks at the same time over a decade

ago. The company space efficiently located the system in their onsite truck garage by converting a service bay.

"The water is right there at the washout system. There is no running back and forth from one site to another, so we are saving a significant amount of time compared to the previous washout pit," says Gelewski.

One unique aspect of this approach is that there is no need to "dribble" or "slowly meter" the washout material into the machine. The system is designed to take in 8 cubic yards in four minutes or less.

The one-stop approach saves money by eliminating long-distance drives and slow process times. With high-speed washouts, the concrete plant can run fewer trucks with less labor and material handling while still delivering the same amount of material or more.

"Now, we no longer need to have a washout pit or a pile of excess material on the side that we have to pay to truck out," says Gelewski.

Instead, according to Gelewski, the washout system provides excellent separation, so Tanis Concrete can sell material that it previously paid to haul away.

"The system separates the clays and cements from the sand and gravel. We could have screened out the three-quarter, three-eighths inch stone from the sand and reintroduced it into our mixes, but choose to sell the material," says Gelewski.

Since the machine recycles the water, this approach eliminates the cost of replacing makeup water in ponds and pits, which lose water constantly due to seepage and evaporation. There is also no pond sludge to clean up and no pit to excavate and maintain.

"Our washout system reuses the water, so our water usage costs went way down," says Gelewski. He notes that this capability also helps to prepare the company for a future of potentially greater regulatory scrutiny of water use.

The approach also saves concrete plants a considerable amount of space since one compact unit

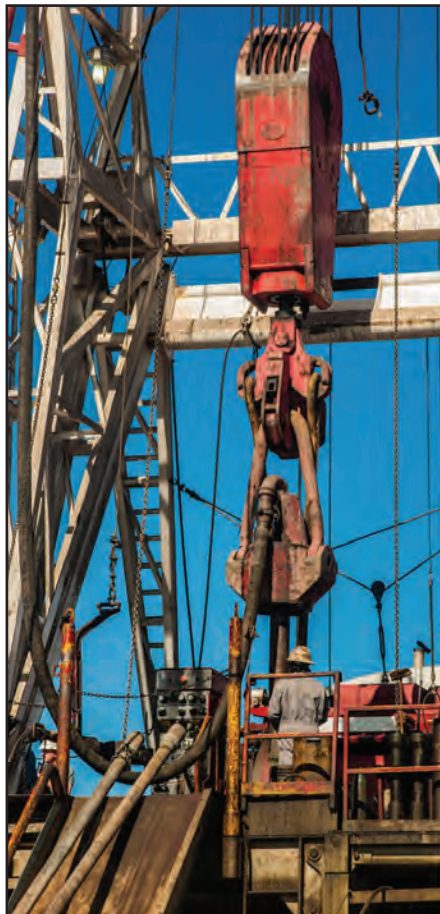
accomplishes the truck washout. Without settling ponds or pits, the plant can use the space more productively as storage for concrete products and inventory or other needed applications.

To help concrete plant executives calculate the potential savings of the streamlined approach, Jadair offers a savings estimator that evaluates factors, such as the cost of material, labor, and truck operation. By inputting these variables along with the number of hours the plant operates per day, the estimator can provide a comparison of potential savings versus current methods.

For concrete plants where settling ponds or pits are still in use, the Jadair Redi-Claim System works similarly as an efficient washout material reclamation solution because it can still separate sand, aggregates, and cement. However, this system directs washout water to the plant's existing settling ponds or pits to be clarified.

Although washout pits and ponds are common, concrete producers that take advantage of innovative options can streamline the washout process and boost their productivity. With the sophisticated systems available today, plants can now reclaim any leftover concrete materials faster with more profitably than ever before. ■

DEL WILLIAMS is a technical writer based in Torrance, California. With over fifty years of industry experience both in the mining and concrete industries, Jadair International Inc. continues to be a leader in the design and development of the highest quality, most capable water clarification and concrete washout and reclaiming systems available. For more information, call 800.669.3411 or visit www.jadair.com.



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The new skid design uses a lightweight aluminum pipe core with protruding plastic fins to provide nozzle stability without the weight of heavier steel skids.

MOVIN' UP THE SEWER LINE JUST GOT EASIER

Advanced lightweight aluminum skids and nozzles provide superior option

BY DEL WILLIAMS

For the municipalities and contractors that clean endless miles of sewer lines, the goal has always been to clean more with less effort and fewer resources. Now, the goal is within reach. Innovation in lightweight skid nozzle stabilizing attachments is enabling sewer crews to move up the line more easily than ever, without getting caught on obstructions such as protruding taps, offsets, and deflections.

Today, advancements in skid design can substantially improve the balance and maneuverability of

nozzles and hoses to speed up sewer cleaning. When used in conjunction with high-performance nozzles, the combination provides faster cleaning that uses less power, pressure, and water. The approach not only eases operator workloads, but also reduces the cost of vacuum truck fuel, water use, and mechanical wear and tear.

STREAMLINING SEWER CLEANING

When sewer cleaning, a process also called sewer jetting, a high-pressure water hose with a specialized nozzle

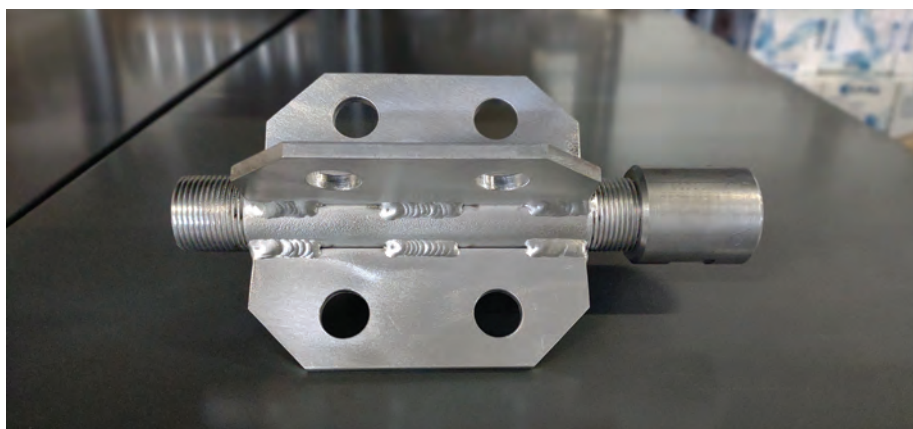
is placed into the line. Operators release high-pressure water from the sewer truck to dislodge debris and flush it into a manhole. As debris is removed, the hose is pushed deeper into the sewer. Jetting typically involves using between 50 to 85 gallons of water per minute with a 3/4- to 1-inch hose from the truck to flush out debris lodged in the pipe. Operators may also use a vacuum to remove dislodged debris and transfer it to disposal bins.

To maintain stability with the high-volume jetting, operators typically

use nozzle skid attachments to keep the nozzle and hose centered within the sewer pipe. Today, some designs go far beyond this basic function and can significantly improve safety and performance.

"More advanced skids with holes are designed to balance the nozzle inside the pipe and prevent the nozzle from becoming airborne and coming out of the manhole. Providing additional holes allows the user to secure the nozzle on the skid while inside the pipe," says Dan Story, an experienced trainer and operations manager at KEG Technologies, a manufacturer of sewer and storm line products including Tier 1 to Tier 3 nozzles, chain cutters, floor cleaners and camera nozzle systems. The Spartanburg, South Carolina-based company is a member of NASSCO, the National Association of Sewer Service Companies.

The challenge is that traditional skids are often constructed of steel, which adds weight and reduces



Using a high-performance aluminum nozzle with an aluminum skid can provide approximately 30 percent more power than typically available through conventional options.

maneuverability within the sewer line. In response to these challenges, Story sought to ease cleaning sewer lines. Through testing and experimentation, he discovered a specific technology that could have major implications for municipalities and contractors tasked with cleaning more lines with fewer resources.

"I discovered that if I used a high-performance aluminum nozzle

with an aluminum skid, I could gain approximately 30 percent more power than typically available through conventional options. That meant I could lower the nozzle flow and pressure and still have all the cleaning power I had before," says Story.

Story has further refined the skid design after doing additional R&D and testing. The new skid design uses

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To accommodate the range of sewer pipes in the field, KEG offers aluminum skids in 6-, 8-, 10-, and 12-inch sizes for use with aluminum Tier 3 nozzles such as the Royal family of nozzles.

a lightweight aluminum pipe core with protruding plastic fins to provide nozzle stability without the weight of heavier steel skids. The skid design resembles the shape of a “football” to reduce the risk of snagging on sewer pipe obstructions.

“The design lowers the weight and drag of the skid and nozzle in the pipe. The lighter the weight, the easier it is to propel up the line. The ‘football’ shape and the slick plastic fins also reduce friction, allowing the skid to pass over common sewer pipe obstructions, such as protruding taps, offsets, and deflections. If it hits a deflection in a pipe, for instance, it will ‘climb on top’ of the next step and keep on going,” says Story.

The approach enables superior sewer line cleaning with significantly less power, PSI, and water, which translates into some important advantages in the field.

BETTER CLEANING AT LOWER PRESSURE

Cleaning sewer lines at lower pressure reduces the load on vacuum trucks. Toward this end, using a lightweight aluminum skid improves nozzle maneuverability to keep the jetted water stream centered within the pipe and focused where it needs to clean.

When used with a high-performance aluminum nozzle, the

combination can produce at least 30 percent more cleaning power than traditional options because it keeps the jetted water stream centered within the pipe and focused where it needs to clean. This reduces pressure and water use while still achieving efficient cleaning. Just as important, it allows the operator to lower the vacuum truck's RPMs, allowing them to better conserve the vehicle's fuel use as well as decrease mechanical wear and tear.

“Operators can essentially run the vacuum truck at idle if they are using an aluminum skid and nozzle. They do not have to crank up the truck's RPMs. Instead, they can effectively clean sewers with as little as 1,000 PSI at 35 gallons a minute. It's going to be a game changer for cities,” says Story. KEG manufactures sewer cleaning instruments from various materials including aluminum, as is the case with its new skids and assorted nozzles.

Another benefit of sewer cleaning at lower PSI is reducing the risk of “blown toilets,” which can leave sewer material on the floor and toilet seat, upsetting homeowners.

A blown toilet typically occurs when an operator rushes up the sewer line with minimal cleaning on the first pass. This results in excessive debris on the return trip through the same stretch of sewer line. Air flow

from the nozzle then compresses between the nozzle and the debris, creating significant positive pressure. When the debris passes by a home's service line, the pressurized air blasts up and out of the service line, causing a blown toilet.

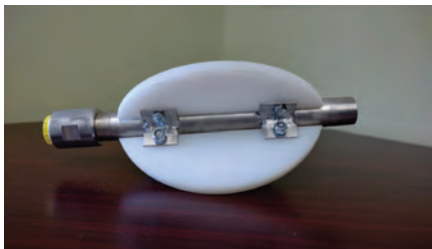
“When sewer cleaning, lowering the pressure involved reduces the risk of a blown toilet, and can be particularly effective when cleaning shallow manholes, which are more prone to the issue,” says Story.

According to Story, he was able to demonstrate the effectiveness of this technique when a city on the West Coast invited him to do a demonstration for them.

“Previously, the city was challenged with a blown toilet problem at a home that occurred virtually every time they cleaned a certain line. They asked, ‘How can we fix this?’ We went in at 1,000 PSI with an aluminum nozzle and skid and cleaned the entire sewer line without blowing the person's toilet,” says Story.

Alternatively, the approach can provide more cleaning power on tough jobs such as accumulated grease at restaurants.

“The sewer line on a street with a fast food, hamburger restaurant was full of grease. A municipal supervisor doubted the cleaning effectiveness of using an aluminum skid and nozzle.



Innovation in lightweight skid nozzle stabilizing attachments is enabling sewer crews to move up the line more easily than ever.

He couldn't believe his eyes when the technique quickly liquified the grease," says Story.

A RANGE OF USES

To accommodate the range of sewer pipes in the field, KEG offers aluminum skids in 6-, 8-, 10-, and 12-inch sizes for use with aluminum Tier 3 nozzles. There are several tiers of nozzles, rated for water efficiency from Tier 1 (about 30 percent efficient), Tier 2 (50 to 60 percent efficient), to Tier 3 (75 to 98 percent efficient).

What sets the most efficient Tier 3 nozzles apart from others in the category is fluid mechanics engineering on a par with the aerodynamics of race cars or jet fighters. In the case of the company's aluminum Tier 3 nozzles, such as the Royal, Cleaning Torpedo, and Aluminum Traction, the high-performance fluid mechanics design leaves little room for power losses and excessive turbulence.

By more effectively containing, controlling, and directing high-pressure water with less turbulence, an aluminum Tier 3 nozzle can deliver more cleaning power at lower PSI. This eliminates the need for operators to compensate for the lack of power from Tier 1 or 2 nozzles by increasing the pressure to higher PSI on the way back through the line. Ultimately, less PSI (with a better, faster result) facilitates safer, more efficient sewer cleaning that complements the use of an aluminum skid.

As municipalities and contractors seek to easily clean sewer lines with fewer resources, taking advantage of innovative aluminum skids and nozzles that enable superior cleaning at lower pressure with less water will become a best practice strategy. ■

DEL WILLIAMS is a technical writer based in Torrance, California. KEG Technologies Inc. is headquartered in Spartanburg, South Carolina. KEG's patented fluid mechanics directs high pressure water from a truck or jetter hose in a manner so efficiently they were granted a United States patent, meaning operators can usually clean pipes using less pressure, less fuel consumption, and less time than other less efficient nozzles. For more information, call 866.595.0515 or visit www.kegtechnologies.net.

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THE KEY TO FACTORY OPTIMIZATION

Digital twins technology has the power to revolutionize industrial applications BY CHANDRAKANT ISI, HUBS

Digital twins are like virtual copies that help factories work better. By analyzing these virtual models, companies can prevent costly mistakes, improve production speed, and even introduce innovations that weren't previously considered. This article sheds light on what they are, the different kinds, how they benefit businesses, and predictions about what innovations they may bring about in the future.

WHAT ARE DIGITAL TWINS, AND WHAT BENEFITS DO THEY OFFER?

Digital twins can be virtual representations of physical objects, systems, or processes that act as a bridge between the digital and physical worlds. The real-time data acquired from sensors and

machines allows digital twins to offer insights for optimizing operations, enhancing efficiency, and making informed decisions.

When used in factories, digital twins offer an array of far-reaching benefits. For example, digital twins help engineers or designers anticipate equipment issues and resolve them before they escalate into costly downtime. This results in increased asset lifespan, reduced maintenance costs, and enhanced productivity.

They can also facilitate informed decision-making through simulations and scenario analyses, allowing engineers to test and validate strategies in a risk-free, virtual environment—leading to better strategic planning, faster problem-solving, and the ability to adapt

swiftly to changing factory or market conditions.

In addition to their operational advantages, digital twins foster innovation and drive technological advancements. By providing a platform for continuous experimentation and prototyping, they expedite the development of new products and services, potentially shortening time-to-market.

Finally, digital twins enable manufacturers to align their sustainability goals with real-world outcomes. They can help optimize resource consumption, energy usage, and waste generation in factories, contributing to eco-friendly practices and reduced environmental impact.

WHAT ARE THE TYPES OF DIGITAL TWINS?

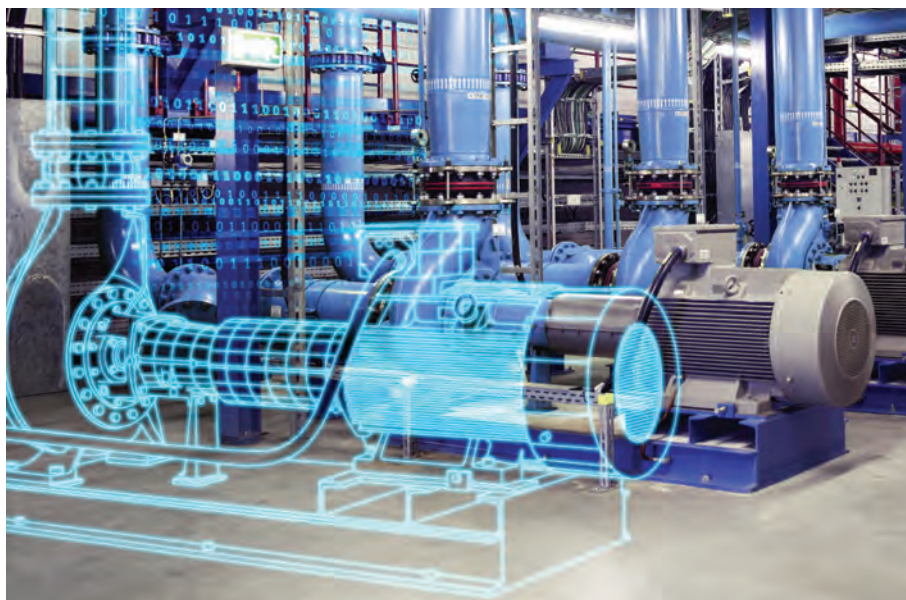
Digital twins are categorized into various types to effectively capture the diverse range of applications and complexities they address. Grouping digital twins allows manufacturers to tailor their implementation to specific needs, such as optimizing product design or monitoring complex manufacturing processes.

Each type corresponds to a specific focus, allowing factories to deploy digital twins that align with their unique objectives. Here are four of the most common types of digital twins.

1

PRODUCT DIGITAL TWINS

Product digital twins represent physical products and assets. They are used throughout the product lifecycle, from design



and development to manufacturing, operation, and maintenance. Product digital twins help optimize machine or part design, simulate performance, monitor usage, and enable predictive maintenance.

2

PROCESS DIGITAL TWINS

Using digital twins, we can simulate and play out manufacturing processes and other complex workflows. They highlight bottlenecks, enhance production, and up the efficiency game. They've also proven to be quite useful in managing supply chain operations—a challenge many businesses have grappled with, as outlined in this report.

3

SYSTEM DIGITAL TWINS

System digital twins represent entire systems or environments, such as factories and industrial complexes, enabling holistic monitoring, analysis, and optimization of interconnected components or processes.

4

ASSET DIGITAL TWINS

Asset digital twins focus on individual physical assets, such as machinery, equipment, or infrastructure. They facilitate remote monitoring, predictive maintenance, and performance optimization

THE FUTURE OF DIGITAL TWINS

As digital twins technology continues to evolve, it will become woven into the fabric of manufacturing for any forward-looking company. From autonomous robotics to intelligent supply chains, the integration of digital twins will pave the way for smarter, more efficient, and highly responsive manufacturing ecosystems.

Francesco Rivalta, engineer at Hubs, points out that despite the innovation in digital twins technology, there's room for further refinement. For instance, creating the digital twin is quite a complex process that requires specialized hardware,

software, and professionals who need to understand both the technology and the domain to which it's applied. However, he remains optimistic that advancements in AI technology will streamline and simplify these aspects to some extent. ■

CHANDRAKANT ISI is content distribution specialist at Hubs and can be reached at chandrakant.isi@hubs.com. Hubs is an on-demand digital manufacturing platform that was founded in Amsterdam in 2013. The platform offers easy access to a wide variety of manufacturing capabilities supplied by a global network of more than 300 manufacturing partners. Hubs was acquired by Protolabs in 2021 to bring customers the world's most comprehensive manufacturing solution. For more information, visit www.hubs.com.



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THE DISASTROUS CONSEQUENCES OF NEGLECTING HEALTH AND SAFETY

*Are food and drink factories designed
with employee safety in mind?*

BY IAN HART, ADI GROUP

When it comes to health and safety in food and drink factories, many tend focus on hygiene within production and the threat of contamination to products, as well as possible risks for consumers. However, the health and safety risks to employees working in these factories are an equally important issue.

2022 HSE statistics show a 28 percent year-on-year rise in non-fatal injuries in the workplace, with slips, trips, or falls; handling, lifting or carrying; and being struck by a moving object being the leading causes. And with more and more people now returning to factories post-Covid, the potential for the numbers to continue to rise exponentially is increasing.

Staff injuries can be particularly detrimental, and not just for the individual, slowing down operations and leading to a decrease in profits along with potential reputational damage. This means that for business owners, being aware of how to minimize the risks is invaluable.

As an engineering company, adi Projects delivers a multitude of projects within food and drink factories. The issue of employee safety is one that deserves as much attention as that of contamination within these environments.

It is a topic of utmost importance. Staff health and safety risks in factories can be overlooked for a number of reasons, and it is vital that these are correctly identified and dealt with for the benefit of employees and overall operations.

WHAT ARE THE MAIN HAZARDS WITHIN FOOD AND DRINK FACTORIES?

There are a number of hazards that are common in food and drink factories and that become difficult to manage if the factors posing a threat are not identified and properly dealt with.

Food factories are inherently full of hazards such as rotating machinery, hot and cold pipes, chemical substances, electrical lines, and much

more. Humans can become exposed to chemical substances, be required to utilize tools or equipment that are not fit for use, or be subject to slips or falls from height.

There is a clear element of danger for staff working within these environments. But this doesn't mean facility owners can become complacent: there are measures and processes that should be put into place to prevent injuries, which can be highly effective.

According to the HSE, over 30 percent of food and drink industry injuries are related to manual handling, such as back injuries, causing around 1,700 acute injuries each year. Manual labor including stacking, moving, or pushing heavy objects is one of the main causes of injury, and automation of these risky repetitive tasks such as through mechanical handling systems can be instrumental in reducing risks. Yet each individual hazard requires a tailored solution.



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Of key importance is taking a responsible, holistic approach to risk management. Hazards such as slips, falls, and those stemming from workplace transport, moving objects, or machinery hazards can't be eliminated altogether: there are certain processes within factories that can't be eradicated yet. But this doesn't mean that these hazards can't be controlled to reduce risks.

DESIGNING FACTORIES WITH SAFETY IN MIND

Minimizing risks starts with factory design, and has it at its core. There are specific considerations to be taken when designing food factories to maximize safety and increase accessibility. Factors include limiting points of contact between hazards and humans, such as having hot or cold pipes in the ceiling void instead of anywhere near people, or ensuring rotating machinery is adequately guarded, so that risk of injury to those in the factory is minimized.

With slips and trips making up for 35 percent of major injuries in the food and drink sector, being caused by wet floors, uneven surfaces, or other obstructions, design factors become particularly important in this context. Ensuring safe access with proper facility design is equally vital when it comes to falls from height—the third most common cause of fatal injury in the industry. There is often a mentality that dictates that slips, falls, and similar accidents are common in these environments, and that there

isn't much that can be done. But this mindset can be incredibly detrimental.

When designing facilities, it's important to give some thought to the overall infrastructure, asking questions such as how do you make the factory as dry as possible? How do you prevent contamination of walkways, or ensure there's enough grip on the floors? Something as simple as building factories with the proper flooring or having suitable lighting inside the facility can significantly reduce certain risks.

Ultimately, it's about alleviating all the sources of danger and reducing staff exposure to hazards. If the risks are adequately addressed at the design stage, achieving continued high levels of safety becomes easier in the long-term.

MAINTENANCE AS A PRIORITY

Manufacturers in the industry often operate from older facilities with outdated equipment, which can constitute a challenge with regards to health and safety. Regardless of whether certain safety measures were put into place at the design stage when factories were built, it is likely that unless proper maintenance has been carried out, the facility is no longer safe.

Regular health and safety assessment of the production lines and of the equipment are essential in any facility. Many forget that over time, equipment breaks down, or decide to make significant alterations without carrying out proper risk assessments.

Equipment could be perfectly



safe and compliant when it's first introduced, but that doesn't mean it will remain safe after years of continued usage. Maintenance needs to be a continuous priority: in a live factory, things are changing all the time, which means that the reassessment of lines is vital.

There has to be an adequate awareness as to the risks brought on by a certain type of equipment, what its life span is and what investments are needed to enable this equipment to continue to be safe. And overall, it's up to manufacturers to build this vital awareness in order to protect its staff and ensure the smooth running of operations. ■

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IAN HART is business development director for adi Projects. As a director and chartered engineer, Hart has twenty-five years executive board experience, successfully establishing and developing customer focused, engineering-based business and delivering high value investments in both private and public sector organizations throughout the world. adi Projects has provided innovative solutions for a number of clients dealing with complex facility design and health and safety challenges, solving each problem at hand with a tailored, strategic approach. For more information, visit www.adiltd.co.uk/divisions/adi-projects.



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THE DESIGN TO TAKE ON DOWNTIME

Fail-safe pumps deliver on every wastewater application

BY ELSA BUENO, TSURUMI AMERICA

Pump downtime is a major concern among wastewater plant operators. If a pump suddenly stops working, the consequences could be disastrous. Facility closure or stoppage puts the surrounding waterways and residential areas at risk of sanitary sewer overflow.

To alleviate these concerns, Tsurumi has ensured that its pumps come equipped with fail-safe features. The pumps have integral thermal protection switches that can detect high motor temperatures and shut off the pump before any severe

motor damage occurs. The seal chamber contains moisture detection sensors that can detect seal failure.

A DIFFERENCE IN DESIGN

"When moisture is detected, an alarm alerts the issue to the operator, preventing severe damage," explains Pat Donahue, engineer at Tsurumi America. "These tools are designed to detect common, yet often overlooked problems early, allowing for timely responses and the prevention of extended pump downtimes. All pumps will encounter damage such as clogs and seal leaks, but early detection is key to avoiding prolonged downtimes."

According to Donahue, the durability of wastewater pumps is especially important in cutter and chopper applications—tight tolerances and sharp edges need to be maintained to prevent clogs.

"Tsurumi's cutter design utilizes a tungsten carbide cutter piece brazed onto the tip of the impeller vane as well as a high chrome serrated wear plate. These hard materials work in tandem to provide cutting with minimal wear and tear," Donahue says.

Tsurumi's chopper impeller is constructed of hard cast iron that rotates and cuts against the high chrome stainless steel chopper

blade. While constructed of hard, wear-resistant materials, abrasion will eventually increase the gap between the impeller and cutter/chopper. Both Tsurumi's cutter and chopper designs feature clearance adjustability to return clearance back to factory-level settings.

NEARLY 100 YEARS OF INNOVATION

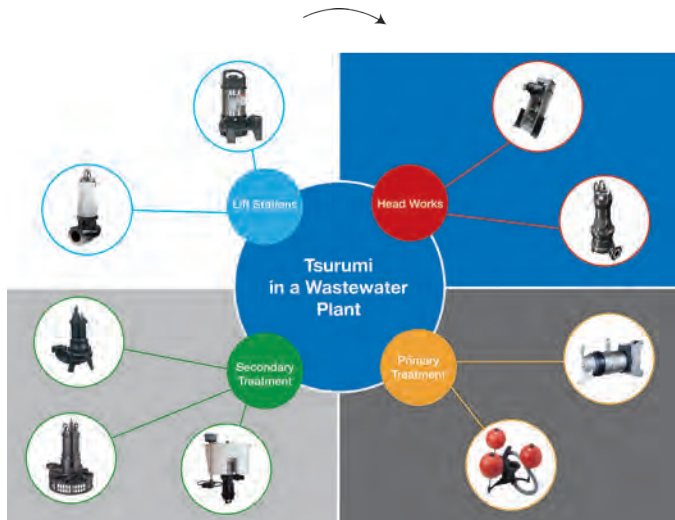
Tsurumi Pump's rich history dates to 1924 in Osaka, Japan. It was the first pump company in Japan to establish submersible pump technology, pioneering the use of durable materials and simple, reliable designs that are easy to operate and maintain. Tsurumi's established designs helped designate the company as a leader in the construction and mining sectors.

"While Tsurumi's pumps are better known amongst the construction and mining industries, the company's wastewater lines utilize the same design philosophies, construction materials and features that are proven to withstand the most aggressive industries," Donahue explains.

Tsurumi's wastewater pump line includes a variety of styles to accommodate a wide range of applications. The company's wastewater line includes choppers, cutters, grinders, high head, open channel, and vortex. Pump

COMPANY UP CLOSE

- Tsurumi wastewater pumps are known for being heavy-duty and easy to use and maintain.
- The company's pumps are equipped with fail-safe features that put leak concerns to rest.
- Tsurumi was the first manufacturer to establish submersible pump technology in Japan nearly seventy years ago.



adds. "In addition to many types of pumps, Tsurumi provides a variety of process equipment including bar screens, and submersible aerators and mixers. With these various styles and features, we can be a one-stop wastewater solution from residential collection to final treatment. Tsurumi's pumps are known for being heavy-duty, durable, and reliable. These are the tenets that build partnerships with our customers." ■

Tsurumi (America), Inc., a division of Tsurumi Manufacturing, was founded in 1979. Headquartered in Glendale Heights, Illinois, Tsurumi (America), Inc. has bases in Quebec, Canada; El Paso, Texas; and Salt Lake City. Globally, 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.

features include cooling jackets (open and closed loops), corrosion-resistant material options and the FM hazardous location certification (AVANT Series). They are used in residential areas, such as lift stations that move wastewater to a treatment plant, as well as within the wastewater treatment plant, where these pumps advance the water through the treatment process.

"Every plant with a form of liquid process requires wastewater collection and transfer. Large enough plants require their own internal treatment process," Donahue

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MORE SUSTAINABLE PUMPING USING PERMANENT MAGNET MOTOR TECHNOLOGY

This proven technology helps pump owners and operators optimize system performance Part 2 of 2

BY MARIO DESIMONE, FRANKLIN ELECTRIC



In part one of this series, we discussed some of the many factors that can improve return-on-investment (ROI) time, increase sustainability, and boost productivity—with an emphasis on a growing solution for delivering higher efficiency with proven reliability: a pumping system built around a permanent magnet (PM) motor. Below, let's explore more of the benefits PM motors can provide across different applications.

SUSTAINABILITY

The earlier benefits listed in this series deliver cost savings that also add up to more overall sustainable operation. Lower electrical usage saves money for users, but also reduces the carbon footprint associated with the application. For example, in the mining dewatering setting operating at 12 hours per day, the mine site personnel observed an annual carbon dioxide reduction equivalent to 32.3 tons in a year—and avoided paying for nearly 42,000 additional kilowatt-hours. In

the municipal setting running 100 horsepower equipment 10 hours per day, the energy efficiency improvements obtained by switching to this technology would be equivalent to replacing more than 304 incandescent bulbs (60W) with LEDs every year. Another way to look at it is the additional power required for the induction system is roughly 13.5 tons of carbon. According to the EPA it would take almost 15 acres of forest to sequester the added carbon dioxide every year.

In addition, PM motor systems offer quieter operation to reduce noise pollution when compared to above-ground pumping sets, minimizing their impact on people and the surrounding environment. Working hand-in-hand with sustainability is resiliency, or the ability to adapt and overcome unforeseen environmental conditions. For example, with the effects of climate change and warmer temperatures, many drillers are having to go deeper to access groundwater. In Dallas, groundwater used to reside at 600 feet and now must be pulled greater than 1,000 feet. In Lubbock, Texas a pivot irrigation sprinkler used to be supplied by three wells and now requires over ten wells. These situations equate to additional energy requirements that could be partially or completely offset with PM motors.

PROVEN PERFORMANCE IN SUBMERSIBLE APPLICATIONS

PM motors provide considerable benefits in submersible applications over induction motors. If you are currently running an induction motor in a submersible pump and replace it with a PM motor, the PM motor will win every time in terms of less overall cost of ownership, more efficient operation, better performance and less downtime. Consider the following:

- Permanent magnet motors run with an efficiency rate of about 90 to 94 percent.
- Permanent magnet motors deliver better performance across a range of speeds for longer motor life and better overall performance.
- Permanent magnet motors operate with no slip: in contrast with standard induction construction, their speed is constant regardless of load, delivering consistent water distribution.
- When paired with a pump in submersible installations, PM motors offer higher efficiency operation and speed compared to other pumping systems that rely on induction motors.

These are just the beginning of the benefits owners and operators





experience with PM motor technology. It is also an efficient alternative to vertical line shaft turbines and submersible systems powered by traditional induction motor designs.

BETTER SYSTEM PERFORMANCE

PM submersible motors typically have four poles, whereas an induction motor will rely on two-poles. This requires the motor to run at 120 Hz to achieve 3,600 RPM. VFDs are the only suitable motor control device that will allow a motor to run above the power line frequency. Today, more full-service manufacturers offer reliable solutions that range from 4-inch motors up to 300 horsepower using 10-inch submersible motors.

As technology progresses, manufacturers have also come a long way in providing cost-effective solutions that are built around variable frequency drives (VFDs) engineered to operate with both induction and PM technology rather than custom ones. This also delivers versatility and allows the units to serve multiple industries,



applications, and job requirements, such as:

- In general, varying the speed of the motor and pump based on demand.
- Built-in lead/lag and alternation capability make them an ideal solution for simple or multi-pumping systems.
- Phase conversion

Select VFDs are optimized to seamlessly be paired and perform with PM motors. In the past, variable frequency for these types of installations led to an intimidating and complex setup process; now, new solutions have been engineered to deliver ease-of-use. In some cases, you might experience a setup that feels as intuitive as installing a plug-and-play drive.

VFDs are the most popular electronic device used to vary the speed of a pump, and for good reason. PM motors have no slip and are designed to run with a synchronous speed at their rated voltage. This means you are not compromising speed for efficiency. When running a PM motor with a VFD, you can enhance and expand your pump envelope by gaining optimized efficiency. A PM motor paired with a VFD delivers not only energy savings and protection but also advanced speed control and soft start that maximizes the system's life and mitigates maintenance costs throughout its lifespan. In addition, VFDs that have been optimized and designed for water systems will support the prevention of a dry-well scenario, protect against pipe leaks and electrical surges, and reduce stress on plumbing thanks to its pipe-fill mode.

COMPATIBILITY AND SCALABILITY

High efficiency pumping systems with PM motors are offered in a variety of sizes and can easily grow with a user's needs. Getting the system from one manufacturer can help with this compatibility and scalability.



A single system manufactured and shipped from a single source will allow for simple startup, compatibility with a variety of application types, optimized performance and extended system life. Some offer service options to ensure users are backed up for sizing and selection as well as setup. In terms of scalability, users do not have to compromise efficiency when the system needs to grow.

CONCLUSION

Pumping systems that utilize a PM motor are becoming more widespread, due in part to their functionality across a wider range of pumping application needs. When paired with a VFD, they offer easy set up features and optimized operation, helping owners and operators benefit from more efficient system operation and cost savings that continue to add up throughout the entire lifecycle of the system. ■

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CHALLENGING WASTE STREAM MEETS ITS MATCH

HRS completes its largest ever evaporator to tackle the task

BY MATT HALE, HRS HEAT EXCHANGERS

At a manufacturing facility outside the Spanish town of Lorquí, a 52-foot-high evaporator has steadily been constructed over the last twelve months. Now complete, the unit, which is the largest evaporation unit ever constructed by HRS Heat Exchangers, will soon be dismantled for transport and installation at its operating site.

The combined evaporator and crystallizer, which will have a total capacity of ten tons per hour once operational, has a footprint of 1,450 square feet and is designed to treat concentrated waste brine produced by an on-site reverse osmosis plant resulting in the production of distillate,

which is returned as process water, and crystallized waste. This HRS evaporator unit will form part of an upgraded zero liquid discharge (ZLD) system for treating the client's challenging waste stream and meeting local environmental regulations.

NEW HRS EVAPORATOR SYSTEM

The new system has a total weight of 59 tons and covers a total area (across all four operating levels) of 4,500 square feet. In total it includes nineteen tanks, fifteen heat exchangers of different sizes, and some 100 different lines of piping of various diameters. The system includes a pre-heater, degasser, evaporator, and crystallization sections, together with a final condenser.

In order to meet the challenging specification, including the highly corrosive nature of the sodium chloride-rich brine, which is

produced by the client's reverse osmosis system, the HRS system incorporates a number of non-standard features. Firstly, the heat exchangers have been constructed from titanium, rather than HRS's standard construction materials of AISI 304 and AISI 316L stainless steel.

Secondly, rather than using a traditional five-effect forced recirculation evaporator, this system uses a five-stage multistage flash evaporator. The benefits of this flash evaporator over forced recirculation are that it only requires a single recirculation pump, instead of one pump for each effect, and that the pump is installed at the lowest temperature level in the loop, meaning less risk of cavitation and fewer issues with corrosion—an important consideration given the nature of the brine being handled. Finally, this design means that a lower overall recirculation rate is required,



HRS Heat Exchangers has recently completed construction of its largest ever evaporator.



The new evaporator from HRS heat exchangers is 52 feet high



The evaporator crystallizer includes nineteen tanks and fifteen heat exchangers.

meaning less energy is required for the pumping process, improving overall process energy efficiency.

Once the brine has passed through the five-stage evaporator, the now concentrated brine is sent to a crystallizer unit, which removes the last of the distillate and produces 1,500 pounds per hour



As well as a multi-stage flash evaporator, the project also includes a crystallizer.

of humid crystals (at approximately 70 percent dry matter).

Once the crystals have been formed, the crystal "slurry" is transferred to the client's mechanical separator, where the humid crystals are extracted, and any remaining saturated brine solution is returned to the crystallizer. As a result of this final crystallization stage, no liquid from this process or waste stream will be discharged from the client's site, making this a true ZLD effluent treatment solution.

PRODUCTION, INSTALLATION, AND COMMISSIONING

Since winning the order in early 2022, it has taken fifteen months for the multi-disciplinary HRS team, led by Technical Sales Engineer Tomas Stiebe, to design the evaporator and crystallizer and construct it at the manufacturing hub in Murcia. The unit is currently undergoing final checks

and testing and will then be partially dismantled for delivery to the client. It is expected to be delivered to site in May and will then be commissioned by HRS engineering staff later in the year. Once fully operational it will process 10 tons of brine effluent per hour, producing 1,500 pounds of humid crystals and returning all distillate water to the existing client processes.

This system is the largest evaporator produced by HRS to date and builds on previous ZLD systems that the company has delivered to clients in Europe and further afield. 🇪🇺

MATT HALE is the international sales and marketing director with HRS Heat Exchangers. Located in Atlanta, Georgia, HRS Heat Exchangers is part of the HRS Group, which operates at the forefront of thermal technology, offering innovative heat transfer solutions worldwide across a diverse range of industries. With forty years' experience in the food and beverage sector, specializing in the design and manufacture of an extensive range of turnkey systems and components, incorporating corrugated tubular, and scraped surface heat exchanger technology, HRS units are compliant with global design and industry standards. For more information, visit www.hrs-heatexchangers.com.

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2023 TOP PRODUCTS

Whether it's at product launches, factory tours, or trade shows, the staff at MPT is afforded an up-close look at the newest offerings for our industry, and each December, we look back on the year that was and present our choices for the Top Products spanning the industrial pump and rotary equipment markets.

In the pages that follow, MPT shares its selections for the products that speak to the industry's needs for efficiency, reliability, and innovation. Each of our Top Products was chosen through submissions from our staff, advertisers, and readers like you. The products range from large multinationals you're likely familiar with to smaller, regional suppliers worthy of your attention. Regardless of their size or reputation, they all offer value you can take into the new year.

Enjoy!

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Check-All Valve® is happy to announce the addition of the Adapter Valve to our full-service line of check valves. The Adapter Valve is available in two styles, model AM (MNPT x FNPT) and model AF (FNPT x MNPT). Both models have the same size pipe thread on both ends for installation where a threaded straight adapter is needed. The one-piece body design is machined from high quality bar stock and is manufactured at our factory in West Des Moines, Iowa. ■

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OPTIMIZING MICROBIAL PERFORMANCE

Precise temperature control isn't just about microorganism survival; it's about maximizing their performance. It's about converting waste into valuable resources like biogas, reducing the environmental impact of waste disposal, and contributing to a more sustainable future.

Hydro-Thermal NOH heaters are specifically designed to maintain the required temperature range for mesophilic and thermophilic digestion, facilitating optimal biogas generation and reducing the detention time in the digester.

COMPARING NOH HEATERS WITH TRADITIONAL HEAT EXCHANGERS

Traditional methods like heat exchangers have long been the go-to solution in sludge heating. However, they bring challenges, including energy inefficiencies and maintenance complexities. This has paved the way

for innovative alternatives like Hydro-Thermal NOH Heaters, presenting a direct and highly efficient method to address the shortcomings of traditional heat exchangers.

ENERGY EFFICIENCY

- Traditional heat exchangers transfer heat indirectly through a metal barrier, resulting in significant energy loss.
- NOH heaters, on the other hand, achieve a remarkable thermal efficiency of 100 percent by injecting steam directly into the process fluid, utilizing both sensible and latent heat.

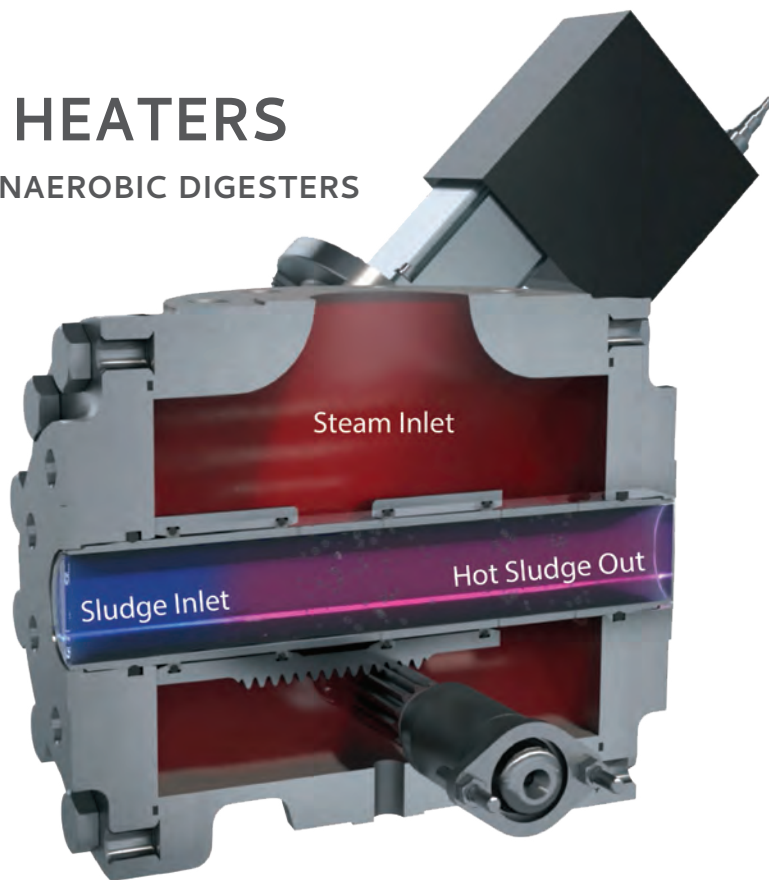
MAINTENANCE CONSIDERATIONS

- Heat exchangers pose maintenance challenges due to condensation, necessitating the maintenance of low water temperatures to prevent fouling.

- NOH heaters feature a straight flow-through configuration that minimizes clogging, requiring no specialized tools for maintenance. Additionally, their wear and corrosion-resistant metallurgies enhance durability, even when dealing with abrasive materials.
- NOH heaters eliminate burn-on risks associated with traditional heat exchangers, ensuring a safer operational environment.

SPACE AND INSTALLATION EFFICIENCY

- NOH heaters boast a compact design that saves valuable space, making them particularly suitable for installations with limited room.
- Easy integration into existing piping systems eliminates the need for a separate condensate return system, leading to substantial cost savings during installation. ■



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MEGALERT

MOTORGUARD

MegAlert manufactures the MotorGuard patented testing and protection systems designed to detect insulation breakdown in critical motors. The system senses when the pump motor is offline and then performs a continuous dielectric test on the winding insulation until the equipment is started again. When an abnormal condition is detected the equipment can be locked out and a warning signal sent, indicating that the pump motor needs maintenance.

Reduce risk to save lives! The testing is done with a current limited non-destructive DC voltage from 500 to 5,000 VDC, which is safe for both personnel and the equipment. By automatically testing offline equipment customers can now predict and prevent impending failures, reduce unscheduled downtime repairs, and increase plant safety by not exposing maintenance personnel to dangerous Arc Flash conditions experienced when performing manual testing.

MotorGuard applies a current limited, fixed DC voltage to the motor windings during idle periods. A solid-state comparator circuit monitors measured leakage current to the ground. Two adjustable set points, factory preset to customer specifications, can be programmed to signal a pre-alarm, alarm, and lockout the equipment from operating if the low set point is exceeded. The manual reset feature enables a return to operational status only after the alarm condition has been corrected. MotorGuard will not impair normal operation of the equipment being monitored.

For over three decades, MegAlert has offered this patented, cost-effective, and proven technology with almost unlimited applications to multiple industries in both the private and government sectors. ■



GP2500-MU-AS



For more information, visit

WWW.MEGALERT.COM

SUNDYNE

SUNDWASH PRIME

DELIVERING CONSTANT HIGH-PRESSURE WATER-ON-DEMAND
FOR CENTRALIZED CLEANING AND WASHDOWN SYSTEMS

Sundyne's industrial grade Sunflo pumps have a proven track record for providing exceedingly high pressure in an energy-efficient, compact footprint. For decades, Sunflo pumps have been widely used in high pressure washdown applications that are common to power generation, maritime, transportation or food and beverage industries. In 2019, Sundyne introduced SundWASH® high-pressure wash-down packages that combined the power of Sunflo pumps with motors, motor starters, pre-programmed logic controllers (PLC), flow meters, recirculation control valves, temperature switches, and piping to create turnkey SundWASH systems for food and beverage applications. Today, the SundWASH system has been enhanced via the new SundWASH Prime™, which is a fully integrated, pre-engineered system that can be configured to any process requirement. SundWASH Prime provides constant high-pressure water-on-demand for a wide range of applications, including:

- Food and beverage cleaning systems
- Industrial spray and washing systems
- Reverse osmosis systems
- Ultra-filtration systems
- Boiler feed systems.

SundWASH Prime delivers constant, pulsation-free pressure on demand. There is no waiting for pressure to build up, and there are no drops in pressure. SundWASH Prime's Integrated Variable



Frequency Drive adapts to changing operational requirements, and it can support multiple operation modes.

FEATURES

The newly redesigned SundWASH Prime system consists of:

- Sunflo high pressure pump
- Energy efficient VFD control
- Constant, pulsation-free pressure on demand
- Low flow/high flow protection
- Field adjustable settings
- Ethernet communication with site DCS
- 316SS construction

BENEFITS

- Intelligent minimum flow by-pass (opens only when required)
- Automatic stand-by and sleep modes
- Field adjustable and field serviceable:
- Maintenance made easy. No need to remove pump from the system
- Communication with site DCS for back-office control of system via Ethernet protocols
- Energy efficient—NEMA Premium Efficient motor.
- Small footprint

TECHNICAL DATA

- 1 to 4 pump configurations
- Capacity up to 2,000 gallons per minute
- Head: 2,800 feet max
- Pressure: 1,000 PSI max
- Inlet pressure: 32 to 140 degrees Fahrenheit (300 degrees Fahrenheit with external cooling)
- Pump and manifold construction: 316SS
- Control panel and VDF enclosure: NEMA 12 or NEMA 4x.

Water demands at food and beverage plants vary widely, making it difficult for single pumps to meet demand—but SundWASH Prime systems scale as needed without compromising on performance. Boosting pressure increases efficiency, enabling operators to get the job done with less water and fewer chemicals. In addition to high pressure, SundWASH Prime systems are easy to maintain. One person with one wrench can repair the pump in less than one hour—saving operators time while reducing labor costs. ■

For more information, visit

WWW.SUNDYNE.COM

VAUGHAN

THE VAUGHAN CONDITIONING PUMP™

A BEAST JUST BELOW THE SURFACE

American-made and built to last, the Vaughan Conditioning Pump™ is a Vaughan Submersible Chopper Pump mounted on a portable stand and fitted with high-velocity mixing nozzle. The Conditioning Pump recirculates the contents of the wet well, chopping and mixing to produce a homogeneous mixture that is easily pumped out.

Floating mats are removed and solids that have accumulated on the floor are re-suspended. As the pump is mounted on a portable stand it can easily be used in multiple applications at a single jobsite, facility, or municipality.

WHY CHOOSE VAUGHAN CONDITIONING PUMP?

BUDGET SAVER

When Vaughan created the Conditioning Pump, they designed it to be used in several different scenarios to save you from costly clean out cycles and maintenance. Here are a few examples:

LESS VACUUM TRUCK VISITS

By re-suspending and removing floating solids that have accumulated on the floor, the Vaughan Conditioning Pump™ reduces—and in most cases eliminates—the need for costly vacuum trucks, saving thousands of dollars each year.

HELP EXISTING “NON-CLOG” PUMPS FROM CLOGGING

If the large pumps you are currently using in the station (wet well or dry well) are clogging on solid filled liquid they are trying to pump, it can be a costly endeavor to replace the pumps. Some pumps can cost you upward of \$350,000 to replace. Vaughan created the Conditioning Pump to solve this problem at a fraction of the cost. You can put the conditioning pump into the wet well and chew up all of the rags and solids so that the existing pump will not get clogged.

REDUCE UNNECESSARY 3RD-PARTY CLEANING CYCLES

Lift stations/collection pits tend to form floating mats that standard lift station pumps cannot pump out. If left unattended, the layer will continue to thicken until you eventually need to call in a vacuum truck to suck off the thick layer. This results in thousands of dollars in maintenance and dumping fees. The Vaughan Conditioning Pump™ can get rid of unnecessary third-party cleaning cycles and the unwanted costs that come along with them, by recirculating/conditioning the pit until the mat disappears.

CIRCULATE “SETTLING LAYER” OFF YOUR WET WELL OR SUMP

When solids fall out of suspension, they create a “settling layer” at the bottom of the tank, resulting in costly

third-party cleanout cycles. The Vaughan Conditioning Pump™ re-suspends these solids so the duty pumps can actually pump out and remove the solids, and also save you from those costly clean out cycles. ■



For more information, visit
WWW.CHOPPERPUMPS.COM

GREASEZILLA

FATS, OILS AND GREASE (FOG) SEPARATION SYSTEM

Developed by Downey Ridge Environmental Company, Greasezilla® is a turnkey system that provides an ecological and cost-effective process to divert FOG from the waste stream. Greasezilla® leaves almost nothing to be landfilled and has a total operating cost of one to two cents per gallon, making Greasezilla® the ideal front-end pretreatment system for FOG waste.

Greasezilla's® hydronic thermal system takes grease trap waste in its trucked-in form and separates it into three layers—brown grease, batter, and water. The brown grease is pumped off and stored, with the remaining layers sent to wastewater treatment plant headworks or anaerobic digesters. The brown grease is a high-quality advanced biofuel, ready as a biodiesel feedstock. Greasezilla® can also polish used cooking oil (UCO) into a premium yellow grease advanced biofuel.

Greasezilla® is fully automated, making it easy to operate and maintain with minimal staffing. Greasezilla's® standard two-tank reactor system requires a footprint of

only 1,000 square feet and is available in two formats to accommodate interior or exterior placement.

Currently, the company is working closely with pumpers and wastewater treatment sites across the nation eager to incorporate Greasezilla's® sustainable, proven, and profitable technology into their operations. ■



For more information, visit

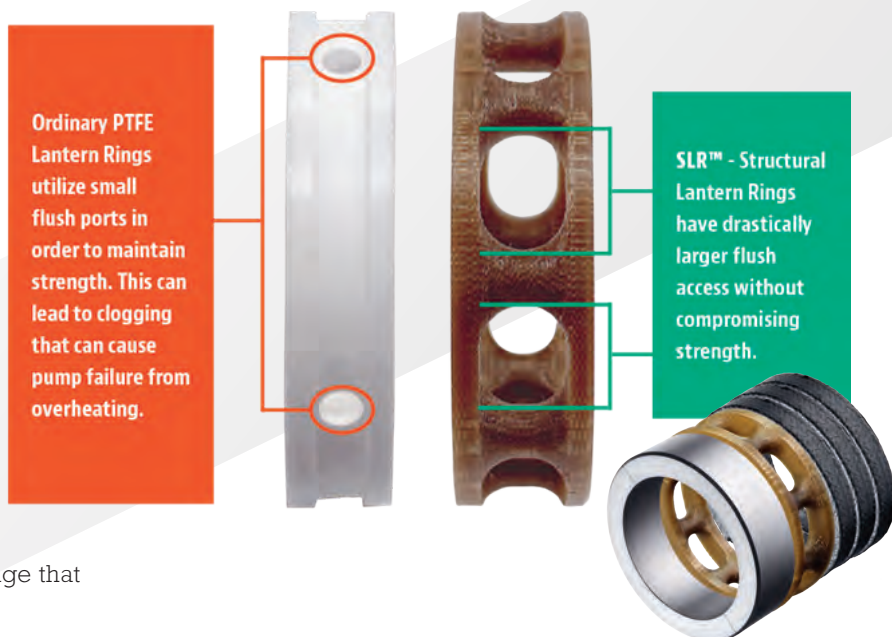
WWW.GREASEZILLA.COM

SEALRYT SEALING SYSTEMS

SLR SYSTEM: THE FUTURE OF LANTERN RINGS

The SLR™, or Structural Lantern Ring, is a new, patented, custom-built removable lantern ring that resists clogging, significantly improves flush and flow characteristics over traditional PTFE lantern rings, and is non-collapsible in service. SealRyt® has integrated this product into two new offerings, the DuraPack™ System and the SLR System. Both incorporate the structural lantern ring with SealRyt packing ring sets to create a comprehensive line of sealing products.

The DuraPack System consists of a PackRyt® BRG Bearing and the SLR with SealRyt packing ring sets. This innovative hybrid methodology combines bearing support with the removable, clog-resistant lantern ring. When paired, you get shaft stability and excellent flush capacity in a package that won't crush or shift inside the stuffing box. ■



For more information, visit

WWW.SEALRYT.COM

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PROUDLY MADE IN AMERICA

Since 1960, Vaughan Company has been manufacturing the toughest no-clog pumps in the USA. Our 3rd and 4th generation family-owned and operated company builds cutting edge products that are built to last and keep things flowing smoothly.

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RIGHT PUMP
FOR YOU**



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