



## A Timeline of Successful Innovation

A mindset of innovation sits at the core of Centrisys/CNP's success. Since 1987, we've tackled environmental challenges as opportunities and taken strategic risks to deliver the most robust equipment and processes to the market.

Centrisys/CNP is a talented team of experts who are passionate about biosolids. Our company began as a scrappy startup servicing decanter centrifuges and has become a leader in the biosolids industry by creating a culture of forward-thinking problem-solvers.

## Continuous Improvement Spanning 33 Years

### 1989 - CS Series: Dewatering Centrifuge

Designed and built from the ground up, the CS Series introduces modern centrifuge design standards to the market. It is the first decanter centrifuge using the Viscotherm Rotodiff® as the standard back drive. Developed around a high-torque, low-energy concept and a high-flow feed chamber, the CS Series gently accelerates treated sludge. Optimum scroll configuration and wear components were researched and developed for industry-specific needs.

### 1990 - 3-Phase Dewatering Centrifuge

A customer requests a 3-phase centrifuge to handle different feed materials with various solids concentrations without using an internal pump. The team designs a centrifuge for the oil and gas industry, leading to the development of a Centrisys 3-phase centrifuge.

### 2006 - CS18-3 Dewatering Centrifuge for Petroleum Processes

Developed a classifying and dewatering centrifuge for oilfield and drilling mud applications in Class 1 Div. 1 applications. During development, it was considered a Big-Bowl Centrifuge for the petroleum market. The CS18-3 was the highest capacity centrifuge at that time (CS21-4 surpasses capacity volume). Customers included BP, Halliburton, Baker Hughes, and Veolia.

### 2007 - CS Series: HC Model

Centrisys re-thought the standard CS design to increase G-volume and flow rate. The HC model has all the benefits of a standard sized dewatering centrifuge but has an advantage of a 15-20% increase in throughput capacity.

### 2008 - CS Series: T Model

Centrisys worked with customers in mineral applications to develop a classifying and dewatering centrifuge for the mining and tunneling industries. A customized cone and pool depth are researched and developed for the most abrasive applications in rocks, sand, and grit.

### 2011 - THK Series: Sludge Thickener

Centrisys introduced modern design standards to centrifugal sludge thickening technology. The non-conical design creates greater G-volume and achieves the highest capacity of flow to the centrifuge. The patented Hydro-Pneumatic design has proven that little to no polymer is required to thicken sludge.

### 2014 - Launched CNP - Technology and Biosolids Corp.

In forecasting the need for advanced biosolids treatment, Centrisys develops MagPrex™, a post-digestion P-recovery process, and acquires exclusive North American distribution for PONDUS™, a Thermal Hydrolysis Process. MagPrex currently has seven USA installations, including the world's largest struvite recovery system from digestate in Denver, Colorado.

### 2015 - Lead in the development of the Kenosha Energy Optimization Resource Recovery Project

This design-build project integrates equipment and processes never used in North America. The project reduces energy and solids handling costs by 20%, reduces dependence on fossil fuel energy by 40%, removes 10,000 tons annually from landfills, and produces a Class A EQ biosolids product that reuses 500 tons of nitrogen and 250 tons of phosphorus annually. Centrisys installed and optimized a low-temperature belt dryer to plant specifications. The electrical and control functions are designed to USA standards and a 20-year service and maintenance contract is secured for the dryer.

### 2017 - Acquires exclusive licensing and distributorship of CalPrex®

CalPrex recovers the highest rate of total P. It's a high-efficiency, pre-digestion P-recovery process for utilities seeking to mitigate operations and maintenance issues related to struvite scaling and poor sludge dewaterability.

### 2018 - Centrifuge Balancing Bunker

Designed and built a first-of-its-kind underground centrifuge balancing bunker. The centrifuge bunker uses 12" reinforced walls and a 28" thick machine bed to ensure safety during the balancing process. The bunker separates the operator from the balancing process to provide an added measure of protection for Centrisys technicians.

### 2019 - Low-Temperature Belt Dryer Development

By identifying sludge minimization as a critical driver for biosolids, Centrisys leadership tasks the engineering and R&D teams to collaborate with dryer consultants and industry experts to evaluate biosolids dryers. The goal is to analyze current dryer designs and pinpoint redesign solutions for more robust and practical sludge drying.

### 2021 - DLT Low-Temperature Belt Dryer

After two years of a thorough analysis of current dryer installations, the DLT team concluded a drastic dryer redesign wasn't necessary. Instead, the DLT team pinpointed features to enhance for a simple, more robust low-temperature dryer. DLT's improved features include: redesigning the heat recovery system to be modular and integrated for less intense maintenance in a smaller footprint; a redesign of the sludge feed system to reduce backpressure and improve feed efficiencies; and, a secondary moisture balance system is added for better control of the dry material for all applications. The dryer is built and designed in the USA.

### 2022 - Reacquires Full Ownership of Centrisys

Centrisys successfully acquired 100% ownership of the USA business after being 80% owned by joint venture partner Techcent, a Chinese company, since 2015.

# The Centrisys DLT Dryer Development Team

## Michael Kopper - President/CEO and Founder

With a technical background that spans over 50 years, Kopper is a decanter centrifuge expert. Kopper founded Centrisys in 1987 as a USA repair and optimization company for decanter centrifuges. Never one to back down on a challenge, in 1989, a municipal customer could not wait for a centrifuge to be manufactured overseas. Michael and his team built the first CS Series decanter centrifuge utilizing their dewatering know-how and service optimization expertise. This foundation of innovation still drives the company today, as Kopper leads Centrisys/CNP with problem-solving ideas that advance the industry.

## Jerod Swanson - Regional Sales Manager

Swanson has over twenty-five years of engineering and technical sales experience in the water and wastewater industry. Swanson has the technical aptitude to apply the appropriate technologies and processes for each customer's need. He has a B.S. in Mechanical Engineering from the University of Minnesota and was recruited into the Navy Nuclear Propulsion Officer Program. He served five years with a tour on the USS ENTERPRISE. Swanson was the Industrial Regional Sales Manager and Commercial Leader at Parkson Corporation, designing and integrating industrial wastewater treatment systems before joining Centrisys in 2014. He is currently the Municipal Regional Sales Manager for the Western US and Canada and the market expert for rendering and animal byproducts.

## Hiroko Yoshida, Ph.D. - Research & Development

Yoshida earned her Ph.D. in Environmental Engineering from the Technical University of Denmark, a Masters in Water Resources Management, and a Masters in Civil and Environmental Engineering from the University of Wisconsin-Madison. She began technical collaborations with Centrisys/CNP in 2013 and formally joined the company in 2015. Her research focused on carbon, energy, and material balance through the wastewater and sludge treatment process. Yoshida has authored ten articles related to these topics and supervised two Master's Students conducting greenhouse gas emissions accounting and energy audits for sludge treatment plants. Currently, Yoshida oversees the feasibility studies, pilot tests, new product launches, and she works closely with customers to optimize their solid conditioning and handling processes.

## Luis Garza - Mechanical Engineering Director

Garza has over 25 years of unparalleled experience in decanter centrifuge and biosolids handling equipment innovation and design. He played an integral role in moving the company from a small startup to a globally recognized brand. Designing custom-engineered solutions are Garza's forte. He works closely with engineers and customers to develop biosolids handling systems to fit within the specifications of each project.

## Gerhard Forstner - President of CNP

Forstner joined Centrisys/CNP in 2013 and leads CNP in its phosphorous recovery and Thermo Hydrolysis Process initiatives. Forstner is highly experienced in primary, secondary, and tertiary treatment systems and has worked in municipal and industrial wastewater industries. He has a thorough understanding of biosolids treatment systems, drying and gasification technologies.

## Joseph Hughes - Project Manager

Hughes joined the Centrisys/CNP team in 2014 and has over 30 years of experience working with biosolids equipment and processes. He is the current CNP Project Manager working directly with the implantation and integration of the CNP biosolids treatment processes. Hughes was directly responsible for implementing the Kenosha Water Utility Energy Optimization Resource Recovery Project, managing consulting engineers and contractors to integrate and optimize multiple technologies to meet a range of performance requirements.

“ With the DLT development, our team wasn't looking for a big disruptive change in sludge dryers; it's was about looking at current drying and then refining and honing in on what can make a dryer more effective.

— Gerhard Forstner - President of CNP

## DLT Dryer Industry Partners

### JP Whitney and Associates - Consulting Engineer

John Whitney has over thirty years of experience and sixteen issued patents in waste management and recycling - emphasizing thermal processes. He is a leading expert in thermal process applications, gasification, incineration, drying, and thermal desorption for waste management. Whitney has broad core competencies in chemical and mechanical technologies and has solved some of the most challenging process design and startup issues for many of the largest waste management companies in the industry.

“ We believe one company can't have all the best ideas. It's through collaboration with our customers, partners, and industry experts who share our biosolids problem-solving passion that we create the best solutions.

— Michael Kopper - CEO Centrisys

### Engendren - Thermal Management System Manufacturer

Engendren, a thermal management company that designs, manufactures, and tests heat transfer products for multiple applications and markets. Engendren has over 40 years of experience in the heat transfer industry and employs 150 highly qualified people, including engineers, designers, and mechanics. Engendren has a strong reputation for quality products with exceptional on-time delivery and superior performance.

### McCotter Energy System - Boiler and HVAC System Suppliers

McCotter Energy Systems provides high-efficiency commercial boiler room and HVAC systems uniquely designed to provide reliability in many applications. McCotter specializes in complete boiler room design with a selection of high-efficiency boilers, burners, and water heating equipment suited to industrial applications.