

Do More with Less

Providing robust and cost effective solutions to meet the increasing demands for solids management



Maximizing Efficiencies for Optimum Results

The Centrisys/CNP resource intensification portfolio is both an integrated process solution and/or an individual equipment approach to sludge and biosolids handling; leveraging **proven** technologies to provide viable alternatives to conventional treatment processes.

+ More

- Improve plant safety
- Improve plant efficiencies
- Increase energy efficiency
- Increase biogas production
- Increase nutrient recovery
- Improve nutrient quality
- Improve sludge dewaterability

- Less

- Smaller footprint
- Reduce equipment size and needs
- Simplify the process steps
- Reduce chemicals and energy costs
- Lower cost of ownership
- Reduce operational and maintenance costs
- Reduce landfill and disposal costs

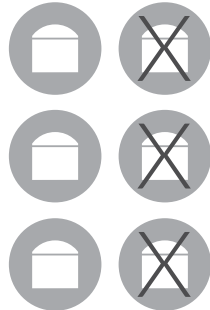
Biosolids management today is faced with challenges that are matched by unprecedented opportunities. A key source of these opportunities is the expanded view of wastewater and solids as renewable resources.

Source: EPA

The Centrisys/CNP Portfolio Supports Global Sustainability

1 THK Series* Primary Sludge Thickener

THK Series is designed specifically to achieve high performance thickening of biosolids. It is not a modified dewatering centrifuge.

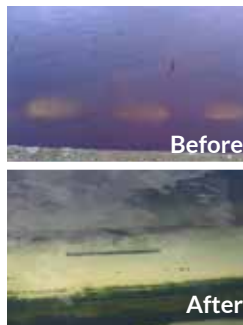


*Also see information in #3.

- Proven no polymer performance
- No conical = greater comparative capacity
- Greater G-volume
- Independent control of liquids and solids weir
- **Digester volume needs are cut in half by doubling the feed concentration**
- Proprietary hydro-pneumatic control of cake solids

2 Passavant® hydrograv® adapt System Distributor for Aqseptence Group GmbH

Passavant hydrograv adapt System is a variable inlet system that eliminates the need for filters.



- **Increase capacity of secondary clarifiers**
- Reduce total suspended solids (TSS) in clarifier effluent
- Reduce total phosphorous in clarifier effluent
- Achieve levels of phosphorus and COD comparable to sand filters, at a significantly lower cost

3 THK Series* Waste Activated Sludge (WAS) Thickener

THK Series sludge thickener is simple to operate with minimal operator attention and has the **lowest total cost of ownership** in the industry.



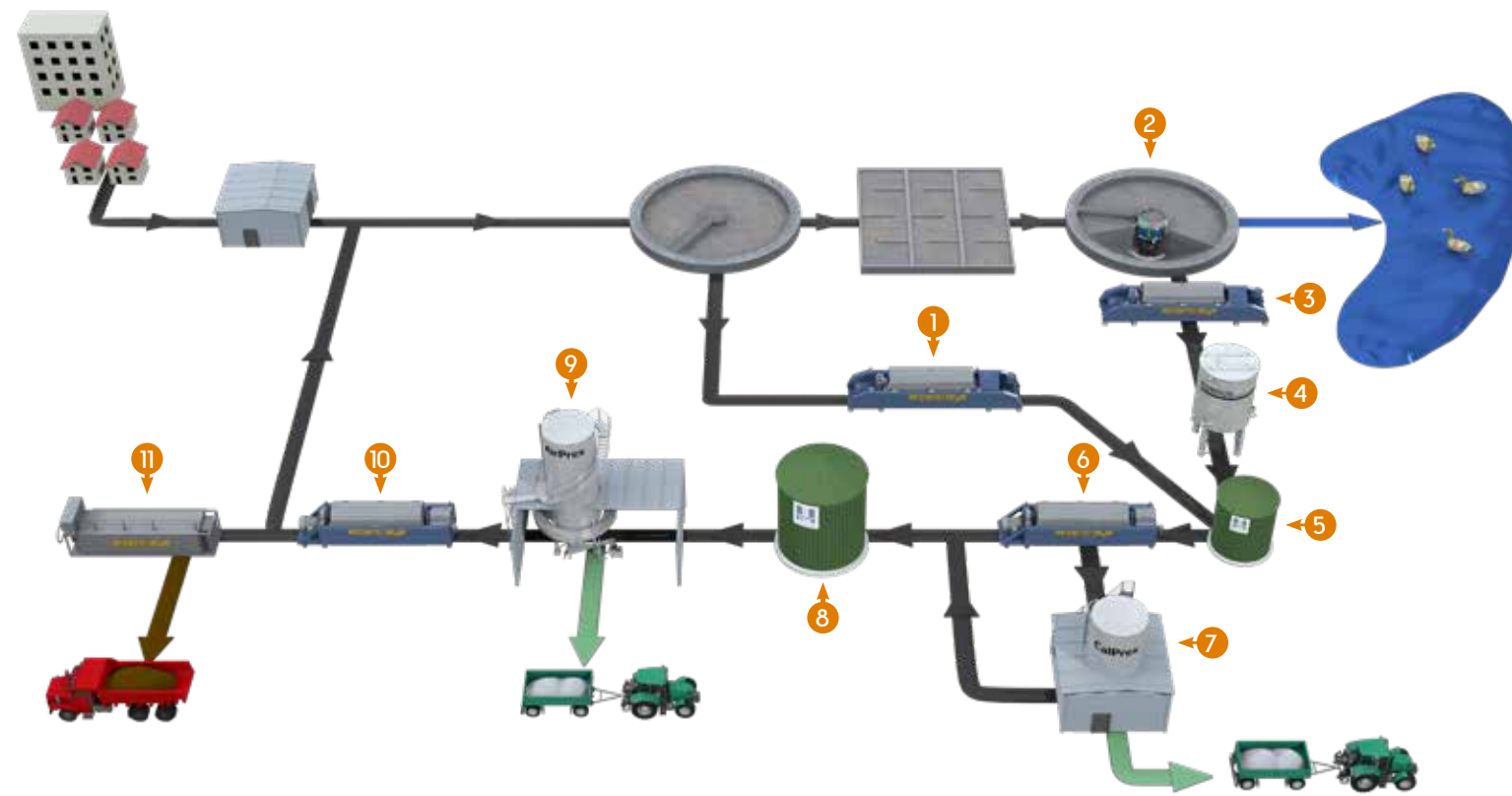
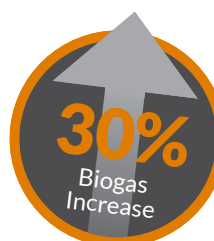
*Also see information in #1.

- 50% less power consumption (compared to standard dewatering centrifuges)
- **Proven no polymer required**
- Enclosed unit reducing odors and gases
- Hygienic operation and safe for operators
- Smallest and most efficient footprint
- Reduce installation costs by 35-50% (\$/gpm)

4 PONDUS™ Thermo-Chemical Hydrolysis Process (TCHP)

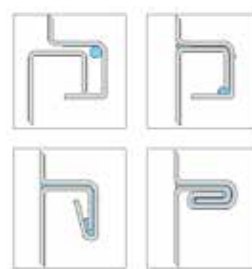
PONDUS, an alkaline process, uses low grade heat (140 °F to 160 °F) and sodium hydroxide for sludge hydrolysis.

- No heat exchangers needed to cool sludge
- No pressure vessel required
- Saturated steam option for sludge above 7% total solids (TS) or with high viscosity
- Minimal equipment needed: high-efficiency heat exchanger, progressive cavity pumps, reactor operating under atmospheric pressure
- **Increase biogas production up to 30%**
- Reduce biosolids disposal costs up to 30%
- Reduce polymer consumption at dewatering up to 20%



5 Liquid Container (Fermentation Tank) Distributor for LIPP America Tank Systems

Liquid Containers are for the storage and treatment of water and wastewater treatment liquids.



- 10,000 to 2,600,000 gallons
- Long operation life
- Flexible sizing, material and equipment
- **Quick assembly with the double-seam system**
- Corrosion resistance with the "Verinox" stainless steel interior lining system

6 CS Series* Pre-Digestion Dewatering Centrifuge

CS Series Dewatering Centrifuge, the most efficient in the industry, is designed and built from what was learned in the field by servicing competitors equipment in both municipal and industrial applications.

- **The Rotodiff® hydraulic scroll drive—our standard backdrive technology from day one**
- Highest G-volume and torque capacity
- Increase solids handling
- Reduce polymer consumption
- Continuous operation
- Lowest installed horsepower
- Driest cake
- Customizable for unique application requirements



*Also see information in #10.

7 CalPrex™ Pre-Digestion P-Recovery as Brushite

CalPrex maintains a 6.5 pH, recovers phosphorus as a brushite crystal with up to 41% P₂O₅ and can minimize digester and sidestream P-loading by over 50%.



- Over 60% solubilization of P in Bio-P sludge
- **Divert over 50% of the soluble P from the digester**
- Reduce up to 50% of the total P in biosolids
- Reduce struvite buildup in the methane digester
- No ammonium required

8 KomBio Reactor (Methanogenic Digester) Distributor for LIPP America Tank Systems

KomBio Reactor is a patented digester with an integrated gas storage. The steel shell protects the **integrated gas accumulator** from UV-radiation and harsh weather conditions. The roof decreases the required heat output during winter.



- 26,000 to 660,000 gallons
- Low process energy consumption
- Zero maintenance and long service life
- Quick assembly with the double-seam system
- Corrosion resistance with the "Verinox" stainless steel interior lining system
- CHP container design, available upon request

9 AirPrex® Post-Digestion P-Recovery as Struvite

AirPrex is the most cost-effective solution, giving all sized plants the affordable option to control struvite and recover phosphorus. It expands the nutrient recovery focus beyond the production of struvite.



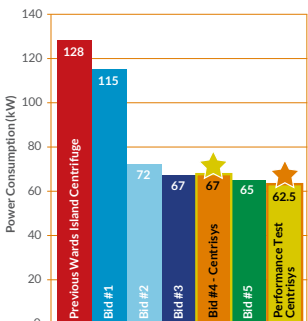
- Reduce and stabilize nutrient loading in the return sidestream to the wastewater treatment line
- **Improve sludge dewaterability**
- Reduce polymer consumption up to 30%
- Reduce maintenance up to 50%
- No sodium hydroxide required
- Reduce struvite precipitation by harvesting, sequestration or centrate recovery

10 CS Series* Post-Digestion Dewatering Centrifuge

CS Series can provide an ROI in as little as 1.5 years with a decrease in maintenance and operating costs.

- **Lowest measured energy consumption****
- Reduce operating and maintenance costs
- Reduce disposal costs
- Highest torque to weight ratio

*Also see information in #6.
**Based on NYC Wards Island performance test in 2017.



11 DLT Series Low-Temperature Belt Dryer

DLT Series is a dual belt, low-temperature belt dryer that can reduce biosolids volume by a third and convert biosolids to Class A.



- Reduce plant operating costs and carbon emissions by reusing waste heat
- Increase safety with low-temperature and minimal dust within the dryer
- **Dried sludge in a granular form with a dryness level of 70-90+%**
- Optimized air-flow system guarantees uniform drying

“ In one year's time, the utility's biosolids facilities were transformed to a state-of-the art biosolids and energy showpiece. Complete cooperation of all project partners was integral to achieving success on this challenging project. ”

Ed Nevers
Donohue & Associates Senior Vice President & Kenosha Water Utility Project Manager



“ The upgrade has resulted in savings of \$1.1 million per year in power, polymer and biosolids disposal costs by improving dewatering operational efficiencies at the WI WWTP. In addition, the upgrade increased the dewatering capacity at Ward’s Island WWTP by 50%, which allows the New York City Department of Environmental Protection to decommission a dewatering facility at one of its other WWTPs. ”

John Rogers
CDM Smith Associate Environmental Engineer

“ While the technologies each individually bring value, it is their holistic approach, as well as the collaboration of partners involved, that make this project special. The key for this successful initiative is trust among partners – Kenosha Water Utility and Centrisys/CNP leaders – and trust from the City of Kenosha in these leaders to deliver. ”

Ed St. Peter
Kenosha Water Utility General Manager