



Solution Name:	Decanter Centrifuge	
Information by: (14.a)	Josh Gable, Sales Director, Centrisys/CNP	Date: 11/08/2023

COMPANY INFORMATION

Company:	Centrisys/CNP		
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TECHNICAL CONTACT (14.a)

DEMONSTRATION SITE CONTACT (15.a)

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INITIAL TECHNOLOGY OVERVIEW

This information is to guide in the development of a more specific and detailed Technology Information Request. Please answer the following questions for each Technology or Service Provided.

What is the name of the technology or service you provide?

Solid/liquid separation via the DT Series Decanter Centrifuge. Service and Repair for all brands of decanter centrifuge.

Please provide a brief (1-2 sentence) description and a full description of this technology.

Attach pages or separate document if necessary.

Summary: (1.a) Centrisys is a USA manufacturer of decanter centrifuges, sludge thickeners, and low-temperature belt dryers, and provides global centrifuge service, repair, and parts for all decanter centrifuge brands.

Full description: (1.b) Centrisys, a leading US manufacturer, specializes in dewatering centrifuges, sludge thickeners, and low temperature belt dryers. With a global presence, we offer comprehensive centrifuge service, repair, and parts for all decanter centrifuge brands. CNP, a subsidiary of Centrisys, focuses on cutting-edge nutrient removal solutions for phosphorus and PONDUS, a thermal hydrolysis process. Experience excellence in centrifuge technology and sustainable solutions with Centrisys and CNP.

Please explain how this technology will improve water quality and/or air quality by one or more of the following: (2.a)

- i. Reducing the nutrient content, organic strength, and/or pathogen levels of manure and agricultural waste.
- ii. Reducing odors and gaseous emissions
- iii. Facilitating desirable waste handling and storage
- iv. Producing value added byproducts that facilitate manure and waste utilization.

- i. Can reduce phosphorus by concentrating nutrients into manure solids.
- ii. Better solids capture and concentration of solids.
- iii. Reduces storage lagoon dredging frequency by removing more solids including the fine solids. Helps producers meet nutrient removal permit requirements.
- iv. Can utilize recovered solids as bedding material or soil amendments.

Do you have a preferred region or area for the location of projects?

Medium to large dairies in the United States or Canada.

Location of farm(s)?

Throughout the United States and Canada.

What's the smallest and largest farm using this system?

1,000 to over 100,000

Input and output of this unit/system – do you have a mass balance analysis? (3.a)

If a mass balance is available, please include below or attach as a separate document.

Mass Balance is available

Input material description and characteristics: (4.a)

For example: raw manure, digestate, screened digestate, suitable non-farm feedstocks, other.

Can be used with raw manure, digestate, screened digestate, and more.

Please provide the expected performance of this technology related to the following: (5.a)

- i. Changes in form or handling characteristics
- ii. Nutrient fate or end use projections
- iii. Macro-nutrient reductions or transformations
- iv. Pathogen reductions or elimination
- v. Air emissions (including gaseous ammonia, hydrogen sulfide, and volatile organic compounds)

- i. Changes in form or handling characteristics – Solids in liquid manure are separated into stackable solid material which can be handled via loader, dump truck, spreader, etc. The liquid fraction after being processed by centrifuge, will be free of nearly all non-colloidal and non-dissolved solids such that very little sedimentation will occur in downstream tanks and/or lagoons, and for dairies using this manure water for irrigation/fertigation, the reduction in solids will allow for much less irrigation nozzle maintenance due to plugging.
- ii. Nutrient fate or end use projections – 40-75% of P will end up in the stackable solid fraction. Nearly all soluble N (ammonium and nitrates, nitrites) will stay with the liquid fraction, as will the K. 50-75% of Organic N and C will end up in the solids fraction.
- iii. Macro-nutrient reductions or transformations – see ii (above).
- iv. Pathogen reductions or elimination – We claim no pathogen reduction benefit.
- v. Air emissions (including gaseous ammonia, hydrogen sulfide, and volatile organic compounds) – Centrisys claims no reduction in air emissions but as the centrifuges is fully enclosed, odorous air could be captured at via a vacuum line connection to the centrifuge housing and sent to a proper scrubbing system. This is commonly done in municipal wastewater installations.

Do you consider this a mature system or ongoing farm development?

This is a mature system.

Any weather constraints? Yes No *If so, please describe.*

Ideally, the decanter centrifuge should be located inside a building along with the control panel.

Any bedding constraints? Yes No *If so, please describe.*

The decanter centrifuge should be placed on a level surface.

Output material description and characteristics:

Please include the % of the total stream for each material, i.e. 10% fiber and 90% screened liquid by weight.

For raw manure: 100% in as raw manure, 80-90% out as manure water-free or large, non-colloidal, non-dissolved solids; 10-20% out as stackable solids containing fiber, fine manure solids with %TS in the range of 28-35% TS.

For screened manure: 100% in from slope screen screw press, etc; 90-95% out as manure water-free or large, non-colloidal, non-dissolved solids; 5-10% out as stackable solids containing some smaller fiber, and majority fine manure solids with %TS in range of 20-25% TS.

Do the outputs of the process have a resale market identified? Yes No

If so, under what brand name or who is the contract with?

There is no specific brand or contract for the outputs. Some farms sell the outputs as their own farm-branded animal bedding and/or soil amendments such as composted manure.

Please provide any alternative uses for the byproducts produced by this technology. (11.a)

Animal bedding and/or soil amendments (composted manure), and the centrate can offset nitrogen fertilizer.

Is this process scalable and to what extent (top and bottom limits)? Yes No *If so, please describe.*

From 5 gallons (pilot scale) per minute up to 700 gallons per minute full scale.

Does this technology require any air input? Yes No

The lubrication system uses an air source although a non-air alternative is available.

What is the preferred air connection? *For example: psi, fitting size, air quality.*

If not distributed by the system, please list each connected device.

150 psi, instrument quality

Does this technology require any water input? Yes No *If so, please describe.*

Water is required for flushing during shutdown only. Some installations use water for cooling of control panels and hydraulic back drive systems.

What is the preferred water connection? *For example: psi, fitting size, water quality, gpm.
If not distributed by the system, please list each connected device.*

Varies depending on size of the system (from 1" to 4" typical).

Does this technology require any electrical input? Yes No *If so, please describe.*

Centrisys centrifuges are operated with two motors, a main drive and hydraulic pump motor. Actual power use is in the range of 0.2 – 0.4 kW/gpm depending on how the unit is incorporated into the dairy.

What is the preferred electrical connection? *For example: phase #, voltage, full load amps.
If not distributed by the system, please list each connected device.*

Depends on size (ranges from 75 kW to 400 kW).

Does this technology require any mechanical input? Yes No *If so, please describe.*

What is the preferred mechanical connection? *For example: horsepower, connection, rpms.
If not distributed by the system, please list each connected device.*

Electric motor for main drive, and hydraulic pump unit for the hydraulic back drive; the hp varies from 15 to 200. The hydraulic back drive varies from 5 to 100 hp.

Does this system require any special plumbing? Yes No *If so, please describe what is required.*

Does this system require any special foundations or pads? Yes No *If so, please describe.*

The foundation must be level.

Do you consider this technology part of a larger system that you provide? Yes No *If so, please describe.*

Does this system require any other components that you do not provide or are not included in this proposal? Yes No *If so, please describe.*

Upstream screening, manure/feed pumping, flow meters, auger systems. These systems can be supplied by Centrisys or our partner dealer if requested.

How is the system delivered to the site? *For example: skid mounted, assembled on site, constructed on site.*

Skid-mounted systems are available. Centrifuges are delivered as a complete unit, mounting and installation are completed on site with the assistance of our dealer partners.

Is this system portable or configured in such a way that it could be easily transported for use in several locations?

Yes No *If so, please describe.*

Mobile systems are available upon request.

**Does this technology negatively impact another critical area or have other regulated characteristics (i.e. emissions, sound, odor)?
If so, what are these impacts and what mitigation measures have been if required by state or local agencies?**

If so, please describe the recommended means of mitigating these impacts.

Centrifuges can generate noise above 85 decibels. Hearing protection is recommended.

What spare parts and redundant components are included with the system?

Each centrifuge system is sold with a standard spare parts kit that includes all necessary bearings and seals.

What equipment, time and resources are required for monitoring this technology and what equipment is included for monitoring this technology? (6.a)

Control panels and remote monitoring systems.

What equipment, time and resources are required to control this technology and what equipment is included for controlling this technology? (6.b)

Control panels.

What is the usable life of the system?

More than 30 years with proper maintenance.

What is the salvage value at the end of the usable life?

20% of a new unit or the value of the scrap materials.

What is the educational and technical level of competence for the operation of the system?

To operate the equipment, the operator should be capable of operating a PC and smartphone. The machine is operated via a touchscreen interface. After initial setup by factory representatives, the system can be started and stopped using automatic sequence controls. Centrisys and its dealers offer troubleshooting support to assist with any issues on an as-needed basis.

What level of maintenance is required for the system? (7.a)

Please indicate if rebuilds or major components must be replaced and what the frequency is for these components.

DAILY MAINTENANCE

1. Monitor main bearing temperatures for excessive high-temperature rise via remote readout. Temperature should not exceed 220°F.
2. Monitor vibration level for excessive vibration or cycling. If abnormal or excessive vibration is noticed, flush the centrifuge to clear any solids build-up that may be causing noted imbalance. Consider lowering the bowl speed temporarily until the vibration dissipates.
3. Compare current values for differential speed, hydraulic pressure, and vibration compare with typical values. Use this to identify possible changes to material or process upstream and to determine how to adjust settings as needed.
4. Check the hydraulic back drive pump unit for oil leaks, oil level, and excessive temperature. Temperature should not exceed 120°F.

WEEKLY MAINTENANCE

1. Check V-belts for stretch or excessive deflection. Re-tighten or replace as necessary.
2. Grease and purge scroll bearings. Remove the opposite fitting or plug on the internal bearings and pump until clean grease emerges. When no opposite fitting or plug is present, grease with 10 shots of hand pump minimum.
4. Check lubrication levels and if necessary, refill the reservoir as needed.
5. Inspect solids discharge and remove any accumulated solids.

MONTHLY MAINTENANCE

1. Open the cover of the centrifuge and inspect the inside housing for solids build-up. Clean as necessary.
2. While the cover is off, inspect the centrate end of the housing and rotating assembly for the build-up of struvite. Remove struvite by chipping or scraping. Where an accumulation of struvite or minerals is present, use products such as RydLyme to loosen up and/or dissolve minerals.
3. Remove the feed tube and washout the pre-chamber area with water using high-pressure water, ideally projected 90 degrees to the centerline of the machine. Take care to minimize water sprayed near the bearings.
4. Check the scroll conveyor for excessive wear on the front of the flight. This may be checked throughout the solids discharge ports by removing the solids upper housing. If wear exceeds 4mm (.156”), notify Centrisys to arrange for a centrifuge overhaul. Quite possibly, a worn scroll may be causing imbalance which may cause expensive bearing failure.

Are consumables used in the process? Yes No

Please provide the nature and purchase relationship for these consumables. For example: proprietary, special contract, generally available.

Which of these NRCS codes would this technology be classified under? Check all that apply. Add if necessary.

CODE	NRCS DESCRIPTION	CHECK ALL THAT APPLY
472	Access Control	<input type="checkbox"/>
560	Access Road	<input type="checkbox"/>
309	Agrichemical Handling	<input type="checkbox"/>
371	Air Filtration and Scrubbing	<input type="checkbox"/>
591	Amendments for the Treatment of Agricultural Waste	<input checked="" type="checkbox"/>
366	Anaerobic Digester	<input checked="" type="checkbox"/>
672	Building Envelope Improvement	<input type="checkbox"/>
372	Combustion System Improvement	<input type="checkbox"/>
317	Composting Facility	<input checked="" type="checkbox"/>
554	Drainage Water Management	<input type="checkbox"/>
375	Dust Control from Animal Activity on Open Lot Surfaces	<input type="checkbox"/>

373	Dust Control on Unpaved Roads and Surfaces	<input type="checkbox"/>
374	Farmstead Energy Improvement	<input type="checkbox"/>
512	Forage and Biomass Planting	<input type="checkbox"/>
561	Heavy Use Area Protection	<input type="checkbox"/>
516	Livestock Pipeline	<input type="checkbox"/>
590	Nutrient Management	<input checked="" type="checkbox"/>
521A	Pond Sealing or Lining, Flexible Membrane	<input type="checkbox"/>
533	Pumping Plant	<input type="checkbox"/>
588	Roof Runoff Structure	<input type="checkbox"/>
367	Roofs and Covers	<input type="checkbox"/>
318	Short-Term Storage of Animal Waste and By-Products	<input checked="" type="checkbox"/>
570	Stormwater Runoff Control	<input type="checkbox"/>
606	Subsurface Drain	<input type="checkbox"/>
635	Vegetated Treatment Area	<input type="checkbox"/>
601	Vegetative Barrier	<input type="checkbox"/>
360	Waste Facility Closure	<input type="checkbox"/>
632	Waste Separation Facility	<input checked="" type="checkbox"/>
313	Waste Storage Facility	<input checked="" type="checkbox"/>
634	Waste Transfer	<input checked="" type="checkbox"/>
629	Waste Treatment	<input checked="" type="checkbox"/>
359	Waste Treatment Lagoon	<input checked="" type="checkbox"/>

Please provide an estimated installed capital cost for this technology and indicate the model, cow number or volume that this cost applies to. (8.a)

Please include all components and designate if provided by you or others.

\$400,000 for 1000 cows; includes controls, flow meter, and stand.

\$750,000 for 10000 cows; includes controls, flow meter, and stand.

Discharge augers, pumps, etc. are installed by other vendors but can be included in our scope or our dealer's scope upon request.

Please provide an estimated annual operation cost for this technology and indicate the model, cow number or volume that this cost applies to. (8.b)

Please include all costs and designate if provided by you or others.

CS26-4DT decanter centrifuge for 10,000 cows

\$10K in electricity, \$40K in maintenance costs (includes machine rebuilds annualized)

Is there financing available for this system? Yes No *If so, what are the conditions for this financing?*

Centrisys can provide a lease-to-buy program that can be customized on a case-by-case basis.

Is the system available for lease? Yes No *If so, please describe.*

Centrisys can rent out a system or provide a lease-to-buy program that can be customized on a case-by-case basis.

What sort of warrantee or guarantee do you provide with this technology? (9.a)

Do you provide any performance guarantees or strictly defects in parts and materials?

Centrisys offers a 12-month warranty from equipment start-up or 18 months from the date of delivery. The warranty covers defects in parts, materials, and workmanship for all items sold as part of the equipment sale.

Explain how this system is unique or transformative and how does it improve upon or go beyond other technologies that are currently available.

A decanter centrifuge does a superior job at separating liquids and solids than filter, belt, or screw presses. The result is a higher level of solids are removed prior to liquids being stored in the manure lagoon meaning that the lagoons will need to be dredged less frequently and when they are dredged less solid material is removed. A decanter centrifuge also has a much higher throughput rate allowing it to process much larger volumes. Centrisys systems are designed specifically for dairy manure, so they can handle the abrasive nature of cattle manure much better than most competitive units. Our hydraulic back drive also requires less frequent maintenance than our competitor's gearbox drives because our hydraulic back drive has fewer moving parts and moves much slower, resulting in less wear and less maintenance.

Please provide the recommended record keeping procedures for end users of this technology. (10.a)

Centrisys recommends that facility staff maintain a log of the maintenance completed and maintain daily records of the bearing temperature and vibration readings.

NRCS considers it the responsibility of the technology provider to furnish information from a university or other independent research entity to document the effectiveness of the technology to achieve its intended purpose in order to be funded through its programs. This information must provide independent, verifiable data demonstrating results of the use of the facility, technology or process in other similar situations and locations and, if available, document the effectiveness of the technology under different climatic factors. Documentation from peer reviewed journals is preferable. Where use of a waste treatment facility or process to improve one resource concern negatively impacts another, impacts and mitigation measures, if required by state or local agencies, are to be documented.

Can you provide independent, verifiable data demonstrating results for the use of this technology in other similar situations and locations? Would you be willing to provide this data in order to qualify for NRCS funding? (12.a)

We are not authorized to publish this information.

If information is provided related to the previous question, please provide the credentials of the individual collecting the data and analyzing the results along with disclosure of potential conflicts of interest. (13.a)

Newtrient has developed a third-party evaluation protocol that can be used in conjunction with a local university or state extension agency to evaluate technologies in a way that will meet the NRCS requirements. Please contact mstoerm@newtrient.com if you are interested in contracting for this service.

TECHNOLOGY REFERENCES

Please provide customers with whom we can discuss this technology and its performance. (15.a)

Include a company name, location, contact name and contact information.

Reference 1

Company Name:	
Company Location:	
Contact Name:	
Contact Information:	

Reference 2

Company Name:	
Company Location:	
Contact Name:	
Contact Information:	

Reference 3

Company Name:	
Company Location:	
Contact Name:	
Contact Information:	

Reference 4

Company Name:	
Company Location:	
Contact Name:	
Contact Information:	

Are there any other facts about this technology that you feel should be included in this document?

The questions above have been adapted to attempt to glean as much information as possible in order to help Newtrient develop technology documentation that will meet the standards of what is required in a review package for technology to be approved under NRCS Practice Standard 629 (CPS 629 - Waste Treatment) **Note the definition of Waste Treatment is “The use of unique or innovative mechanical, chemical or biological technologies that change the characteristics of manure and agricultural waste”.**

NRCS documentation specifies that the review package shall contain the following 15 items (in black) and from these Newtrient has developed the questions in this document (in red):

1. A description of the technology. If lengthy, this may be placed in an appendix.
 - a. Please provide a brief (1-2 sentence) description of this technology.
 - b. Please provide a full description of this technology. (Attach pages if necessary)
2. An explanation of how this technology will accomplish one or more of the purposes of the standard.
 - a. Please explain how this technology will improve water quality and/or air quality by one or more of the following:
 - i. Reducing the nutrient content, organic strength, and/or pathogen levels of manure and agricultural waste.
 - ii. Reducing odors and gaseous emissions
 - iii. Facilitating desirable waste handling and storage
 - iv. Producing value added byproducts that facilitate manure and waste utilization.
3. The range of volumetric and mass flow rate capacities and hydraulic retention times of the waste streams including the influent, effluent, and recycle streams.
 - a. Please provide a detailed mass balance that demonstrates the range of volumetric and mass flow rate capacities and hydraulic retention times of the waste streams including the influent, effluent, and recycle streams for this technology by model number or as related to a specific flow or number of animals (i.e. 1,000 cows per day or 100,000 gallons per day).
4. The characteristics of the influent waste stream important to the waste treatment or process.
 - a. Are there any characteristics of the influent waste stream important to the proper operation of this technology?
5. Expected system performance related to changes in form, nutrient fate projections, macro-nutrient reductions, pathogen reductions and air emissions including gaseous ammonia, hydrogen sulfide, and volatile organic compounds.
 - a. Please provide the expected performance of this technology related to the following:
 - i. Changes in form or handling characteristics
 - ii. Nutrient fate or end use projections
 - iii. Macro-nutrient reductions or transformations
 - iv. Pathogen reductions or elimination
 - v. Air emissions (including gaseous ammonia, hydrogen sulfide, and volatile organic compounds)
6. Process monitoring and control system requirements.
 - a. What equipment, time and resources are required for monitoring this technology and what equipment is included for monitoring this technology?
 - b. What equipment, time and resources are required to control this technology and what equipment is included for controlling this technology?
7. A typical operation and maintenance plan that includes performance monitoring requirements and a replacement schedule for components that do not have a minimum life span of ten or more years.
 - a. Please provide a typical operation and maintenance plan that includes performance monitoring requirements and a replacement schedule for components that do not have a minimum life span of ten or more years.
8. Estimated installation and annual operation cost.
 - a. Please provide an estimated installed capital cost for this technology and indicate the model, cow number or volume that this cost applies to.
 - b. Please provide an estimated annual operation cost for this technology and indicate the model, cow number or volume that this cost applies to.
9. An example of a warranty on all construction or applied processes not covered by other NRCS Conservation Practice Standards.

- a. Please provide an example of a warranty on all construction or applied processes included with this technology.
- 10. Recommended record keeping procedures for end users.
 - a. Please provide the recommended record keeping procedures for end users of this technology.
- 11. Alternatives for the use of the byproducts produced by the system.
 - a. Please provide the alternative uses for the byproducts produced by this technology.

It is the responsibility of the technology provider to furnish information from a university or other independent research entity to document the effectiveness of the technology to achieve its intended purpose. Provide independent, verifiable data demonstrating results of the use of the facility or process in other similar situations and locations. If available document the effectiveness of the technology under different climatic factors. Documentation from peer reviewed journals is preferable. Where use of a waste treatment facility or process to improve one resource concern negatively impacts another, impacts and mitigation measures, if required by state or local agencies, are to be documented.

- 12. Independent, verifiable data demonstrating results for the use of the facility or process in other similar situations and locations.
 - a. Can you provide independent, verifiable data demonstrating results for the use of this technology in other similar situations and locations? Would you be willing to provide this data in order to qualify for NRCS funding?
- 13. The credentials of the individual collecting the data and analyzing the results along with disclosure of potential conflicts of interest.
 - a. If information is provided related to the previous question, please provide the credentials of the individual collecting the data and analyzing the results along with disclosure of potential conflicts of interest.
- 14. Contact information for the technology provider.
 - a. Please provide a technical contact and a business contact to answer questions regarding the information provided for this technology.
- 15. Contact information for individuals that have implemented this technology at the farm scale.
 - a. Please provide contact information for individuals that have implemented this technology at the farm scale.