

**Technology/Service:** Ductor high nitrogen feed biogas plant

**Information by:** Ari Ketola & Ilkka Virkajärvi

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#### COMPANY INFORMATION

**Company:** Ductor Corp

**Phone:** + 358 10 320 6560

**Web Site:** www.ductor.com

**Address:** Viikinkaari 4

**City:** Helsinki

**State:** Finland

**Zip Code:** FI-00790

#### TECHNICAL CONTACT

**Name:** Ilkka Virkajärvi

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**Email:** Ilkka.virkajarvi@ductor.com

**Address:** Viikinkaari 4

**City:** Helsinki

**State:** Finland

**Zip Code:** FI-00790

#### DEMONSTRATION SITE CONTACT

**Site Name:** -

**Contact:** Ilkka Virkajärvi

**Title:** CTO

**Phone:** +358 50 3655 910

**Email:** Ilkka.virkajarvi@ductor.com

**Address:** Viikinkaari 4

**City:** Helsinki

**State:** Finland

**Zip Code:** FI-00790

#### 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?**

Ductor biogas plant; Ductor ammonia removal, Ductor drying process

**Describe how this technology is used in a larger Nutrient Management System. Please be as detailed as possible.**

Ductor technology enables the removal of organic nitrogen from any nitrogen containing organic material. This technology enables the use of high nitrogen containing materials in biogas production without any ammonia inhibition. The removed nitrogen is converted to ammonia and can be recovered as ammonium sulfate or ammonia water which are used as nitrogen fertilizer. We can separate the phosphorus and nitrogen into two different streams from e.g., chicken manure. This makes the best use of nutrient recycling. Ductor delivers either whole biogas plant with the ammonia removal process or for existing plants just the removal process (AddOn).

**How many systems do you have installed on dairy farms or other livestock operations?**

**SYSTEMS**

**NUMBER OF SITES**

**SIZE OF INSTALLATIONS**

Dairy

1

50 kWe

Pork		
Poultry	1	50 kWe

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

No, we are global

**Location of farm(s)?**

No, we are global

**What's the smallest and largest farm using your system?**

**Input and output of your unit/system – do you have a mass balance analysis?**

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

yes,

**Input material description and characteristics:**

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

manure or any high nitrogen substrate

**Does the technology treat the full manure stream for a farm or a fraction of the stream?**

Full manure stream

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

Mature

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

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

**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.*

Biogas ca 20% of input dry material, digestate ca. 80% of input dry material, ammonium sulfate 10% of input material

**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?*

Any fertilizer marketer

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

Upwards from 10 000 metric ton/year

**Do you have a known scaling factor?** Yes ☐ No ☒ *If so, please describe.*

**Does this technology require any air input?** Yes ☐ No ☒

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

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

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

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.

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

Pumps and solid liquid separation steps need electricity

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

3 phase

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.

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.

Fermenter tanks need a concrete platform for installation

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

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

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

Constructed and assembled on site

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.

Has your technology been accepted by the NRCS and is it included into a practice standard? Yes ☐ No ☒  
If so, please describe if necessary.

Are there any unusable or hazardous byproducts of this process? Yes ☐ No ☒  
If so, please describe the product and recommended means of disposal.

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

Spare part package will be included in the offer

**How is the system controlled and what are the components and capabilities of the control system?**

Wholly automatic

**What is the usable life of the system?**

20 -30 years

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

None

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

Low

**What level of maintenance is required for the system?**

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

Seals and caskets

**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.*

generally available

**Which of these NRCS codes would your 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 checked="" type="checkbox"/>
371	Air Filtration and Scrubbing	<input type="checkbox"/>
591	Amendments for the Treatment of Agricultural Waste	<input 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 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 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 type="checkbox"/>
313	Waste Storage Facility	<input type="checkbox"/>
634	Waste Transfer	<input type="checkbox"/>
629	Waste Treatment	<input type="checkbox"/>
359	Waste Treatment Lagoon	<input type="checkbox"/>
633	Waste recycling	<input checked="" type="checkbox"/>
		<input type="checkbox"/>
		<input type="checkbox"/>

**Can you provide an estimate of the capital required for the installation of this technology?***Please include all components and designate if provided by you or others.***Can you provide an estimate of the operational costs required for this technology?***Please include all costs and designate if provided by you or others.***Is there financing available for this system?** Yes ☐ No ☐ *If so, what are the conditions for this financing?***Is the system available for lease?** Yes ☐ No ☐ *If so, please describe.***What sort of warrantee or guarantee do you provide with this technology?***Do you provide any performance guarantees or strictly defects in parts and materials?***Explain how this system is unique or transformative and how does it improve upon or go beyond other technologies that are currently available.****Would you be willing to provide a location for a site visit by Newtrient?** Yes ☐ No ☐ *If so, please provide location.*

#### TECHNOLOGY REFERENCES

**Please provide customers with whom we can discuss this technology and its performance.**

*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?**