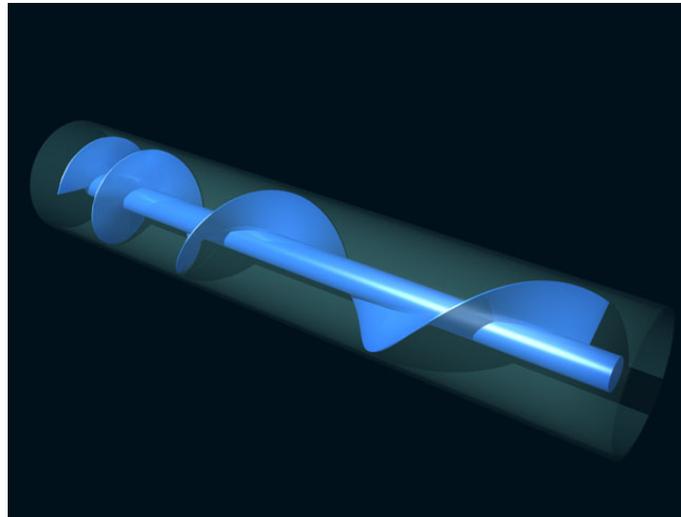


Ribbon Drive Power Generation Apparatus

Development Stage: Engineering scale



Ribbon Drive Power Generation Apparatus

Product Description

Ribbon Drive Power Generation Design Advantages:

- Simple design of reverse pitch helical coils
- Scalable for different applications, including portable
- Large supplies of high velocity water not required
- Horizontal OR vertical Installation
- Economical to manufacture—can build with relatively low cost, light weight polymer or composite

(continued on next page)

Product Highlights		
Standard Unit Design Capacity	100 kW	Design Working Environment <ul style="list-style-type: none"> ■ Natural waterways ■ Water transmission systems ■ Effluent streams ■ Tidal estuaries ■ Near shore ocean ■ Off-shore ocean ■ Deep ocean ■ Other (high rise buildings)
Other sizes currently available	Yes	
Characteristic Dimension	3 ft	
Rotational Axis Orientation	Horizontal, parallel to flow	

Product Description continued

Ribbon Drive Power Generation Design Advantages: *(continued)*

- Staged startup, operates in varying flow conditions
- Self-orienting to ambient water current
- Ease of maintenance and helical vane/shaft replacement
- Faster rotation than other experimental turbines, slower than industrial power turbines
- No energy loss to sideways ambient current transients as in other experimental systems
- Turn an external electrical generator, OR induce an electrical current via Ribbon Drive unit design incorporating magnets and external wiring
- Entering water is in constant contact with a gradual, increasingly angled surface—not just one plane in a traditional turbine; it incrementally captures most of the axial component of the water's kinetic energy

Features:

- a) Squeezed helical coils of a ribbon-like band spin inside a containment cylinder.
- b) One moving part achieves a high capture rate in converting linear to rotational energy without requiring high r.p.m., fast incoming flow or large water volume without complex, expensive multi-bladed turbines; while helping prevent cavitation and decrease surface erosion.

A New Sequence for Rotation

- Water entry initiates shaft rotation

Product Specifications/Details (Standard Unit)

- **Performance Specifications:**

<i>Category</i>	<i>Minimum</i>	<i>Maximum</i>	<i>Units</i>
Flow range	15	20	<i>gpm</i>
Hydraulic head range	4.5	6	<i>ft</i>
Power output range	0.5	100	<i>kW</i>
Waterway depth	0.75	—	<i>ft</i>
Waterway width	0.75	--	<i>ft</i>

- **System Dimensions (feet):** 9 (L) × 3 (W) × 3 (D)

Company Contact Information

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Company Profile

Years in Business	3-5 years
Number of Employees	less than 5 employees
Annual Equipment Sales	less than \$1000

Affiliations/Alliances/Credentials/References/Publications

- Grant from Ben Franklin Technology Partners of SE Penna. to Dept. of Engineering, Villanova U., Villanova, PA
- Business plan award from Baiada Center for Entrepreneurship, Drexel U.
- Consultants: Professors Young I. Cho, V.K. Narayanan, Chris Rorres (Drexel U), Professors Kenneth Kroos, James O'Brien (Villanova U)
- Publications: *Popular Mechanics*, June 2003 issue, "TechWatch", p.24; *Kijk (Look) Magazine*, Sept. 2003 issue, (Netherlands science journal), translated at www.fluidmotive.com