it-micro-redstone

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608-238-6001 [TEL]

greg@infinityturbine.com [Email]

Infinity Turbine LLC

IT Micro Redstone 3D Metal Turbine Counter-rotating Pump

This webpage QR code

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Company Name: Infinity Turbine LLC
Product: IT Micro Redstone 3D Metal Turbine Counter-rotating Pump
Applications: CO2 or High Pressure Turbine with integral liquid pump in same one-cast rotating element
Construction: 3D Metal or cast composites
Uses: Exotic channel micro turbine with common shaft pumping
Benefits: Compact common shaft design turbine which allows complex and exotic liquid pumping channels for multiple flow paths, like the Tesla octopus valve which is similar to the Modular Block

PDF Version of the webpage (first pages)

IT Micro Redstone 3D Metal Turbine with Counter-rotating Pump

The goal of the Redstone project was to incorporate all moving and rotating functions into one component. This is done by using a layered up rotating assembly, or 3D printed in metal or cast carbon fiber.

Expander (turbine): CO2, ORC, Rankine Cycle, refrigerants, CO2, compressed air, water

Compressor (pump): water, CO2, air, refrigerants

Shaft Free: Turbine assembly is the shaft (magnetic bearings or perimeter bearings).

Cavitation Disc: Can be used for making fluids go supercritical (ex. CO2), or can be plugged with magnets to produce induction heating.

History: The Redstone project was made into 3D printed metal (sintered) steel. What we found was that larger parts tended to lose tolerance as the parts grew in size, so the turbine was designed at 2 inches or less in diameter and turned to true for high speed rotational tolerance. The housing castings needed to be machined to tolerance on the inside and trued for surface mounting.

Final Project: The project was printed by X-One when the larger housing tolerance problems were found. We received boxes of these castings, which were ultimately thrown away. A few surviving parts remain (which are solid metal and extremely heavy). There are a total of three parts, which reduces build time and has a huge time savings from standard metal machining. Ultimately, the best method we found (most cost effective and fast) was cutting basic parts with a waterjet, then layering up for 3D effect, and to achieve the internal chamber structure (complex counter-rotating screws).

Plans and licensing available.

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IT Micro Redstone 3D Metal Turbine with Counter-rotating Pump

The goal of the Redstone project was to incorporate all moving and rotating functions into one component. This is done by using a layered up rotating assembly, or 3D printed in metal or cast carbon fiber.

Plans and licensing available. Plans include STL versions which can be 3D printed in plastic (prototype), cast, or metal.

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IT Micro Redstone 3D Metal Turbine

One part turbine and pump.

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IT Micro Redstone 3D Metal Turbine

Side view shows bores for magnets (induction heating), bearing slots, input and exit slots for turbine and pump.

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Back view shows bores for magnets for magnetic coupling, or direct coil power generation.

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IT Micro Redstone 3D Metal Turbine

Cut-away of Redstone assemble which includes the front block, turbine-pump, and rear block. The entire turbine assembly is three parts which can be machined, 3D printed, cast, or layered up depending on application, temperature of working fluid, etc.

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IT Micro Redstone 3D Metal Turbine

Completed Redstone shows the minimalism of the parts used, which results in fast production and reduced time to market.

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