

COMPANY

HydroSpin
hydrospin.net

LOCATION

Herzlia, Israel

SOFTWARE

Autodesk® Inventor®
Autodesk® Simulation CFD

Liquid assets: Generating cleaner, safer water

HydroSpin is developing a micro-generator that enables water utilities to reduce water leakage, which results in substantial cost savings

By using our device, you can power more sensors, get more data, save a lot of money, and significantly reduce water loss, improving the quality of water networks.

—**Gabby Czertok**
CEO HydroSpin

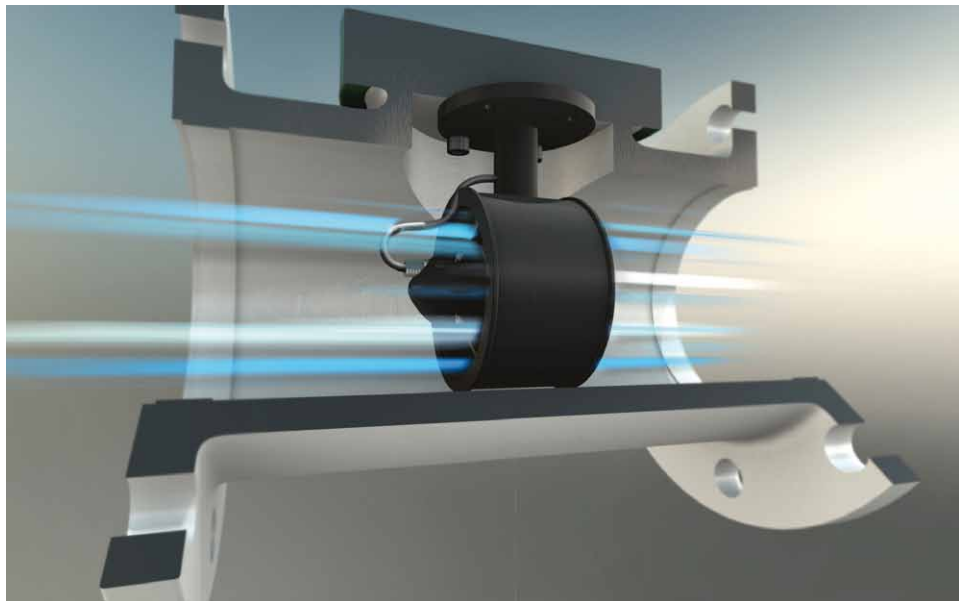


Image courtesy of HydroSpin.

Project summary

Water is essential for all life on earth and, as the demand for food production, washing and drinking increases, it is fast becoming one of our most precious resources. Although water covers 70% of the world's surface, only 1% is readily usable, so maintaining water quality and reducing waste is critical.

Founded in 2010 and based in Israel, HydroSpin has used Autodesk Digital Prototyping tools to assist in the development of a unique micro-generator that produces energy from the flow of water inside pipes, enabling water monitoring solutions to be deployed in locations that do not have immediate access to an electrical supply. The electricity generated is used to power "smart water" monitoring, and transmission devices that monitor the movement and quality of water through the distribution network, as well as other parameters.

The challenge

Water loss is a huge problem for water companies. HydroSpin CEO Gabby Czertok says, "Around the world, 25%-30% of all the water that is treated, pumped, cleaned and filtered, is lost. As water becomes more expensive, the need to monitor it increases too. As a result, water utilities are deploying thousands of sensors to analyze the data, in order to understand where the water is going. And by using this process, the water distribution networks are being transformed into smarter networks, and consequently achieving "smart water" networks. However, providing the energy to power monitoring units in remote locations – many of which are not connected to an electric grid – is problematic. Single-use batteries provide a short-term solution, but are creating an environmental hazard when they become redundant, and the hours they require to be replaced, rule them out as a viable long-term solution. According to International researchers, the smart water network market is bound to quadruple in the next eight years.

The Autodesk Clean Tech Partner Program supports early-stage clean technology companies with design and engineering software they can use to accelerate their development of solutions to the world's most pressing environmental challenges. For more information visit autodesk.com/cleantech

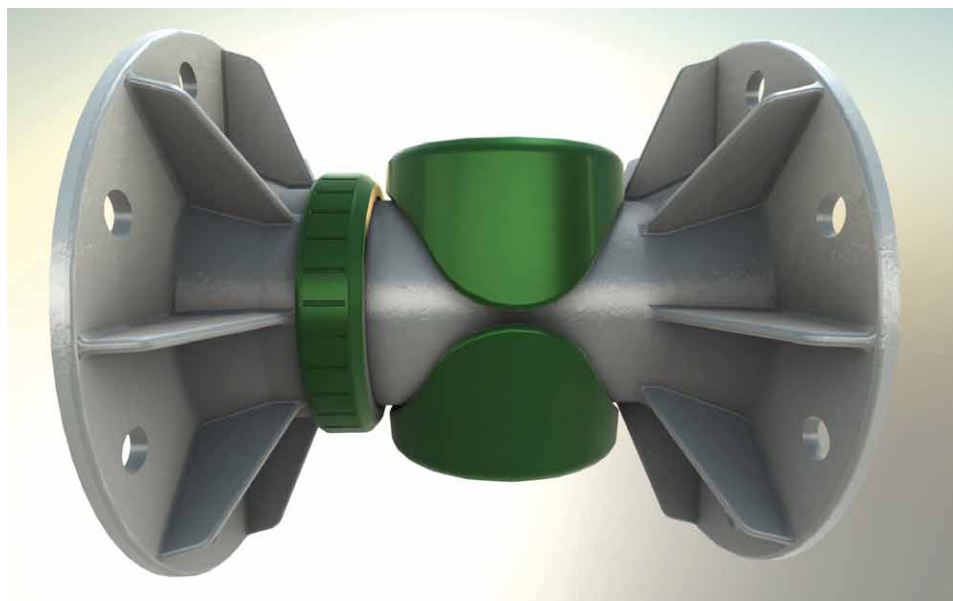


Image courtesy of HydroSpin.

The solution

The idea for HydroSpin came from co-founder Dani Peleg, when a lack of power sources needed for monitoring, proved to be a barrier for an irrigation project. The unique micro-generator that was created as a result, is similar in appearance to a fan-like turbine and uses the water that flows inside the pipes to generate electricity.

It was specifically designed to fit Israel's national water company specifications while creating a minimal disruption to the flow of water with a very small 'head loss'.

Gabby Czertok explains, "By using our device, you not only have access to more locations, you also get more energy from each location, allowing you to transmit the data every five minutes instead of once a day. You can power more sensors and then get more data which

will allow you to save a lot of money by reducing your water loss, all of which improves the quality of the water networks. Research also shows that if you manage the water pressure correctly, you can decrease the energy consumption of water utilities by 30%."

Simulating performance – and saving costs – through Digital Prototyping

As a member of the Autodesk Clean Tech Partner Program, the company was able to access a range of tools – including Autodesk® Inventor® software and other Autodesk Digital Prototyping tools – to speed up the development process. Using Autodesk® Simulation CFD software, the design team conducted extensive stress testing and simulation of flow through the generator to ensure the stability of water flow over an extended period of time at different pressures.

Similarly, they were able to receive valuable input regarding the long-term performance of the generator within a matter of hours – a process that would otherwise have required an actual generator to be placed inside a pipe for thousands of hours at a cost of several hundreds of thousand of dollars.

Gabby Czertok elaborates, "How will you know if the system is going to last for 10 years? The best way is to put it in a pipe for 10 years. Based on international standards, you can get accurate estimations using stress tests, but this is a very expensive process for a small start-up – seeing as a thousand hours can cost hundreds of thousands of dollars. Using Autodesk simulation software saves us time and money, and allows us to test things we wouldn't be able to test otherwise, before we do the actual long term stress tests."

Using Autodesk simulation software saves us time and money, and allows us to test things we wouldn't be able to test otherwise, and to make a real difference in the way we work and manufacture products.

—Gabby Czertok
CEO HydroSpin

The result

Since developing the device, HydroSpin has found water utility companies that are keen to implement it in a range of locations, seeing as the device is able to power monitoring solutions in remote locations as well as inaccessible locations in urban environment.

Gabby Czertok says, "Water utilities want to be independent from the electric grid. For example, a customer in Asia was interested in powering monitoring devices found in several hundreds of locations, using electricity to power the sensor. Seeing as it would have cost them \$1,500 to deploy electric connections from the electric utility the customer reached out to HydroSpin in order to save that cost in addition to the costs of maintenance and time required to deploy so many electric connections. Hydrospin can also save customers the time it might take them to get approvals to connect electricity to a remote location."

Robert "Buzz" Kross, Senior Vice President, Design, Lifecycle and Simulation at Autodesk said, "Clean technology companies like HydroSpin save significant time and money when they incorporate Digital Prototyping tools in their workflow. This kind of efficiency enables more resources to be dedicated toward innovations that can have a real impact and create a better world."

For more information

To learn more about the Autodesk Clean Tech Partner Program, visit autodesk.com/cleantech.

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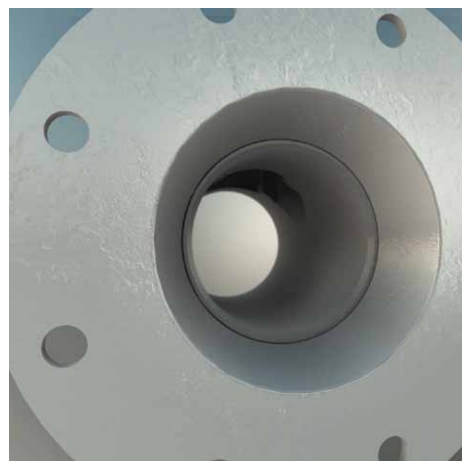


Image courtesy of HydroSpin.