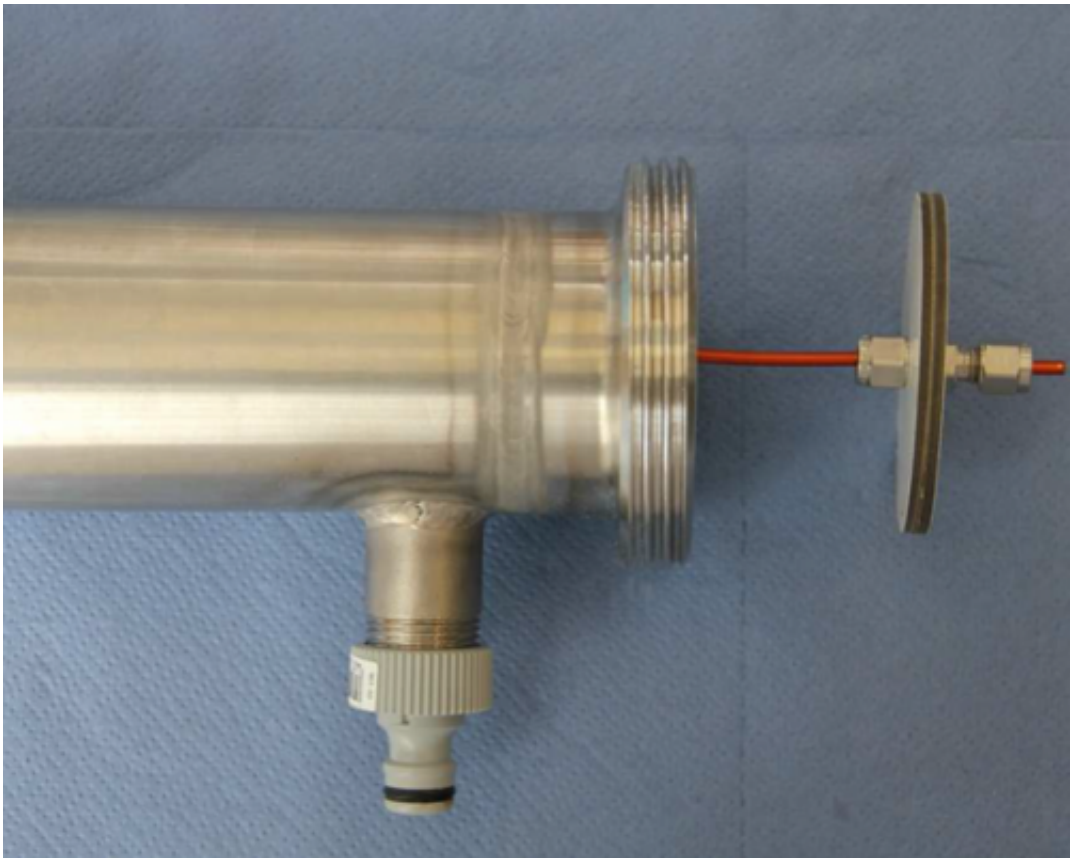
New sensor improves quality check drinking water

December 1 2014, by Kim Hovestad



University of Twente doctoral candidate Natalia Hoog has developed an online sensor which can be used to check the quality of the water in a water purification plant more accurately and more cheaply. Amongst other things, the sensor can measure the amount of rust, salts, bacteria or

alcohol a liquid contains. With this sensor the water purification companies and other companies can save a lot of money, as they can better assess when they have to replace or clean the installations and pipes. Hoog performed her research at Wetsus in Leeuwarden. The company Easymeasure will soon put the online sensor on the market.

Current measuring techniques to assess the quality of (drinking) water are often indirect, which means that employing them are often labour-intensive and therefore costly. Hoog therefore developed a prototype of an online measuring sensor for various applications. Hoog: "The prototype has already been announced on the Easymeasure website, it is expected that the final product will hit the market before the end of 2014. I am very pleased that the prototype doesn't just function properly in the lab but also in 'real life'. My research resulted in six patents, six accepted publications and two submitted manuscripts."

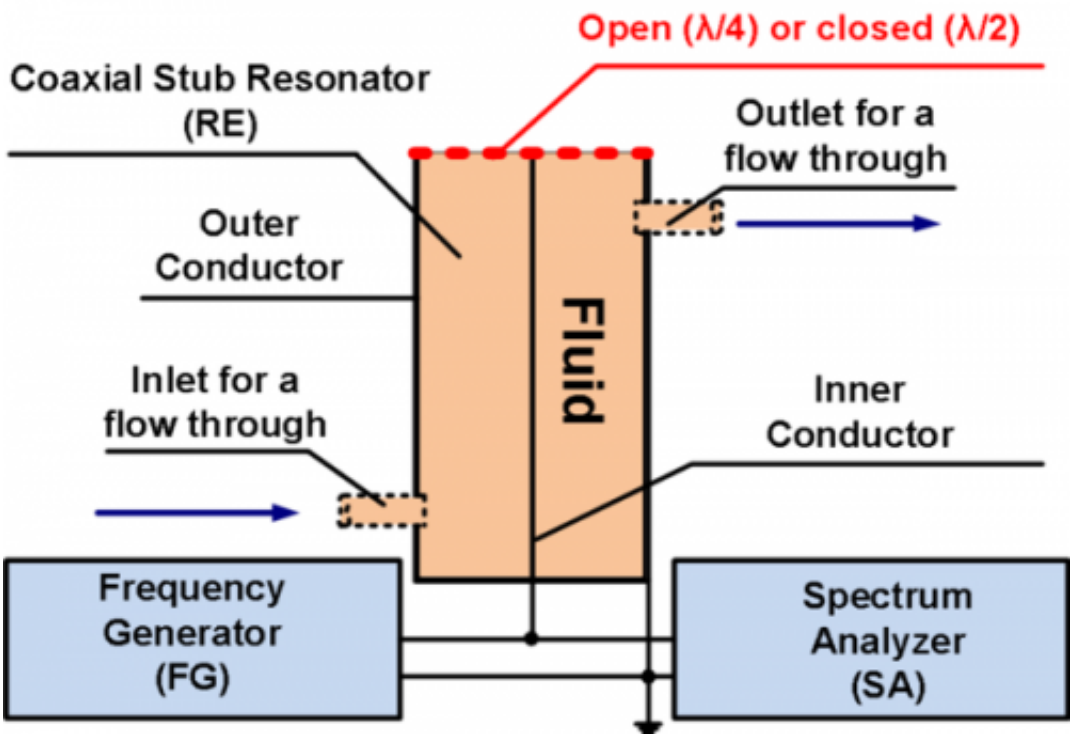
The sensor

Hoog's sensor consists of an antenna with a transmitter and a receiver. The antenna is special in that the liquid that you want to measure flows directly through it. The antenna receives information about the properties of that liquid. The exit signal is influenced by what's happening inside the antenna. On the basis of that signal you can draw conclusions about the properties of the liquid. Assistant thesis supervisor Wouter Olthuis: "We tested the prototype at a water purification plant of Vitens and it works; the employees there were really excited about the first results."

Application

With this sensor companies can save a lot of money, explains Olthuis: "If you can measure when a part needs replacing it's a lot more economical." Water purification plants or process industry companies with water pipes

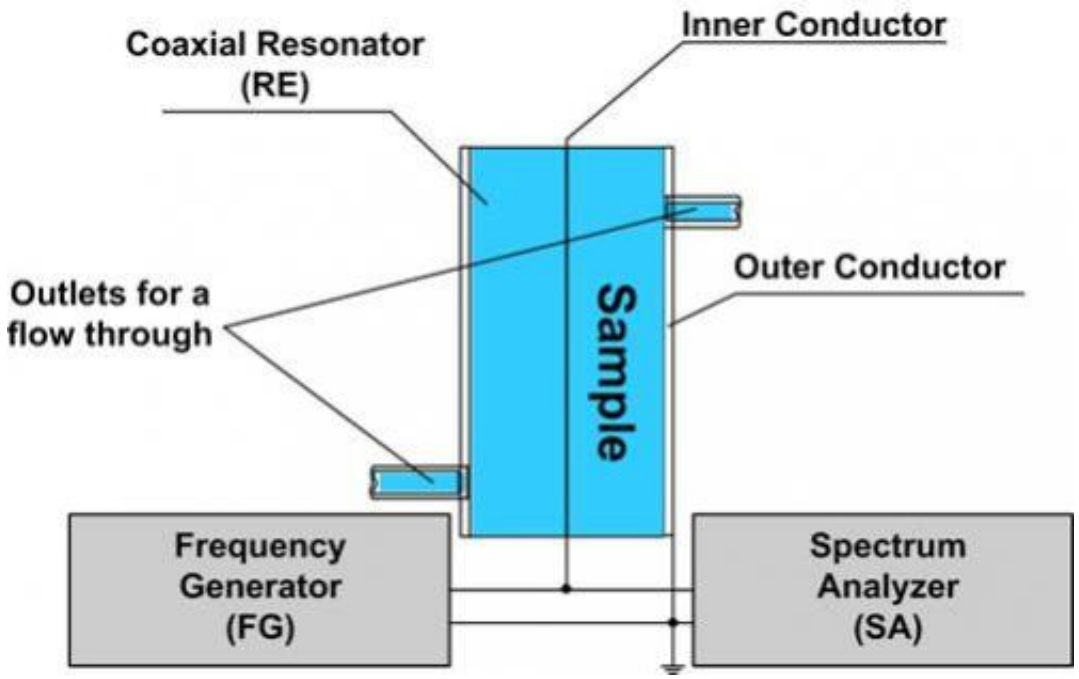
can use the sensor to, for example, measure the amount of rust the water in the pipes contains or when an ion exchanger (which removes salts from the water in water purification plants) is saturated. This way they can deduce when an installation or pipe requires replacement or cleaning or when they need to replace an ion exchanger. Olthuis: "Imagine that normally you have to replace the ion exchanger every week, but the sensor's measurements show that you only need do this once every 9 days. This would save you a lot of money in the long term."



You can also use the sensor to measure bacteria growth in liquids. This is, for example, good news for water purification plant managers. They can use the sensor to determine whether the water's already clean enough, or whether it requires further treatment. Finally, as a frivolous secondary application, the sensor can also determine how much alcohol a

liquid contains. Hoog demonstrated this on Russian vodka. Olthuis: "The amount that Hoog measured corresponded quite closely with the amount as listed on the bottle."

Hoog performed her research at Wetsus in Leeuwarden. The research has partly been made possible by the company Easymeasure. Natalia Hoog's doctoral thesis is called "Stub resonators transmission - line - based water sensors". Hoog recently obtained her doctoral degree at the BIOS Lab-on-a-Chip department of the MESA+ research institute at the University of Twente. She performed her research under supervision of thesis supervisor Dr Albert van der Berg. Her assistant thesis supervisors are Henk Miedema of Wetsus and Wouter Olthuis of the University of Twente.



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