

# New chlorine sensor saves 69,000 gallons of water per year

Halogen Systems Inc. has developed a new chlorine sensor technology that saves water using drinking water measurement processes.

**V**irtually all other chlorine instruments require roughly 69,000 gallons (261,000 litres) of treated water be discharged as waste. This water is discharged because it has been exposed to reagent additions or uncertified materials. Unless the sensor is certified to NSF61, water that touches the sensor cannot be put back into a potable water tank.

However, since this new sensor is certified to NSF61 for drinking water health effects it can be installed directly in a pipe. The flow and pressure independent design enables direct insertion in a pipeline or varying flow.

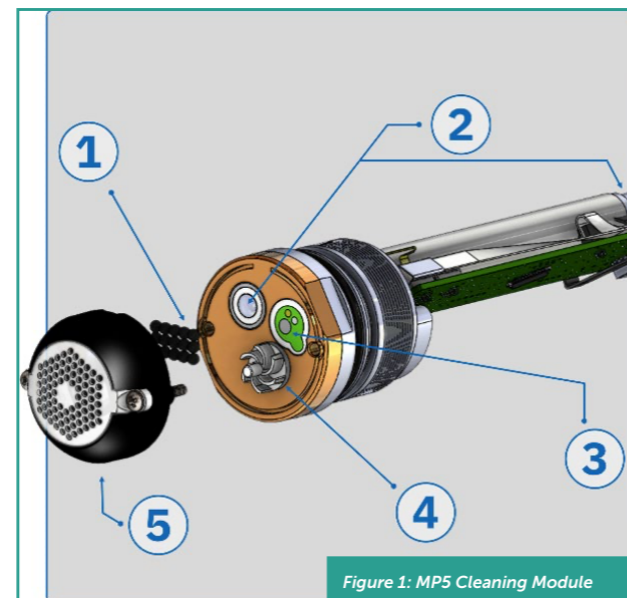
The MP5 sensor requires little to no maintenance, does not use reagents, and calibration is stable for many months. The dramatically reduces labour and reagent costs required compared with membrane style sensors (MP5 has no membrane) or online colorimetric units.

Water utilities can eliminate other discrete sensors for pH, conductivity, temperature and ORP since MP5 delivers all these parameters to its SCADA system. The MP5 has a single interface and displays all five parameters at once simplifying operator training. Maintenance is every twelve months which compares favourably to all other sensors and online DPD instruments. Its compact size is also attractive.

## The development of the technology

This technology was developed, in part from a Small Business Investment Research (SBIR) grant from the Office of Naval Research (ONR), part of the U.S. Department of Defence. It funded a project for the development of a sensor for measuring chlorine in seawater. The goal was a low maintenance, long calibration interval (3,000 hours or 125 days without calibration) sensor to be used on the U.S. Navy's Next Generation Reverse Osmosis unit. Accuracy under various flow rates was also a requirement.

These difficult parameters forced a new approach to the design of amperometric chlorine sensors because the biofouling environment required continuous electrode cleaning (see Figure 1). The successful outcome of this project led to the sensor's commercial use in ballast water treatment systems to prevent the transfer of invasive species, such as zebra mussels. This new self-cleaning sensor was also ideally suited to the drinking water and wastewater applications. Designed for flow independent operation, installation directly in a pipeline is something amperometric sensors were previously not capable of.



*In this sensor, cleaning beads (1) polish the electrode to remove biofilm, salts, and metals from the pH sensor (2) and electrode surface (3). An impeller (4) creates a constant flow through the sensor to both minimize the effect of flow changes in the tank or pipe and to move the cleaning beads to reach all the surfaces. An integral pump volute also holds the beads (1) captive. A Teflon® strainer to keep our large debris that could clog the inlet (5).*

Michael Silveri, president of Halogen Systems, Inc. said: "With water scarcity in many parts of the US, many remote well sites are being brought online to add to the water supply. Often these remote sites operate unattended."

Some municipalities have hundreds of wells and require monitoring on most of them. Reagent cost and truck rolls for maintenance make some sites much more expensive to operate or even uneconomic. A reliable, low maintenance sensor that measures all the critical parameters can be deployed at much lower cost than a suite of discrete instruments.

The self-cleaning feature works well in wastewater and reclaimed water applications. Antonio Thompson, Chief Operator, Iron Bridge Wastewater Reclamation Plant, Orlando, FL commented: "Our other sensors required calibration every shift. MP5 has been accurate for 3 months."

If chlorine is used in their process, other wastewater treatment plant operators should take notice of this new option. This new technology can save many man-hours, improve processes, and reduce cost, both CAPEX and OPEX, for plants. We believe that this technology is a huge leap forward for plant operators and we want to share our experience for the benefit of our industry and the environment."

Steve Gibbs, Plant Manager of Incline Village General Improvement District in Incline Village, Nevada, says of their

sensor's immersion installation: "It can read where no other sensor was able to. The Halogen MP5 sensor gave us better insight into our processes."

Jason Erskine of CL2 Solutions, Florida, agrees: "The Halogen MP5 sensor is a game changer in municipal water treatment for both wastewater and drinking water. It measures five parameters, is not affected by pressure or flow, and is self-cleaning.

"Our customers really appreciate all of the Halogen MP5's benefits. The small footprint, ease of installation, its online and reading in minutes and no maintenance really makes the operator's jobs much easier."

Website: [halogensys.com](http://halogensys.com)



Figure 2: MP5 Direct Insertion Sensor

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