



APPLICATION NOTE Water & Wastewater

Level measurement of an acid dosing tank at a WWTP

- Inventory management and overflow prevention for a poly tank with flocculants
- Reliable level measurement in an environment with strong acid vapours and condensate formation
- Commissioning and configuration via mobile app and Bluetooth®

1. Background

Ferric chloride and other acids are essential chemical substances in water and wastewater treatment. They play a vital role as flocculants in turbidity removal. To control the dosing of acid solutions, an Australian wastewater treatment plant (WWTP) operator in the Sydney area uses a special container to store, mix and add these chemicals.

2. Measurement requirements

The acid dosing tank is a 3 m / 9.85 ft high double walled poly tank with a 400 mm / 1.31 ft long nozzle to penetrate the inner wall. The tanks need level monitoring to prevent dry-run or overflowing. The client previously used an ultrasonic level sensor, which, however, caused regular measurement spikes due to high condensation levels, and the client had to drill breathing holes into the nozzle near the antenna to relieve the situation.

The WWTP operator was therefore searching for a more reliable level transmitter. It was demanded that the instrument be materially compatible with the acidic product and provide reliable measurement for a storage tank with strong acid vapours that can affect accuracy of an ultrasonic device.

3. KROHNE solution

The client opted in favour of the OPTIWAVE 1540 radar level transmitter. This compact and cost-effective 80 GHz radar is designed for continuous, non-contact level measurement of chemicals in low pressurised process environments. The housing and antenna are completely made from PVDF materials, which provide suitable compatibility for most chemicals used in wastewater applications. The high dynamic range of the radar provides repeatable and long-term stable level measurement even in the event of process effects such as acid vapour and condensation.

The OPTIWAVE 1540 was mounted with G1½ connection on the plastic nozzle above the tank. The nozzle diameter was 90 mm / 0.3 ft. Due to the small beam angle of the DN40 (~½ ") Lens antenna, the radar signal can easily pass through the nozzle length into the tank without impinging on the nozzle walls and causing interference. The device was supplied in the IP68 version and can also be used outdoors in heavy rain or flooding without any problems.

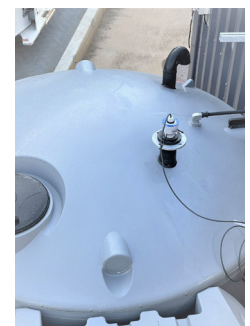
Commissioning was quick and easy via smartphone and secure Bluetooth® using the KROHNE OPTICHECK Level Mobile app. The app guides the user step-by-step through the installation process, offering pre-configurations for various level applications and tank geometries. It only had to be filled with the parameters of the application such as measuring range and distance between radar antenna and tank bottom.



Level measurement in poly tank



OPTIWAVE 1540 mounted on long tank nozzle



Acid dosing tank with KROHNE 80 GHz radar

4. Customer benefits

The cost-effective 80 GHz radar offers a more reliable and accurate performance than the previously used ultrasonic device. The client no longer sees measurement spikes and the reading is stable and accurate. In this way, the KROHNE level transmitter assists with inventory management for the flocculants and also reduces the risk of overfilling and all the environmental and occupational safety issues associated with this.

Its user-friendly mobile app with intuitive setup wizard made commissioning the 80 GHz radar straightforward and convenient for the operator. Using Bluetooth® connectivity, there was no need to climb or stay upon the tank for configuration.

Featuring OPTICHECK technology built-in, the OPTIWAVE 1540 also provides easy access to diagnostics and reporting features. This allows on-site verification and reporting that can be quickly sent away for analysis. The verification can be carried out on a regular basis or just event-driven – by the push of a button using the OPTICHECK Level Mobile app.

5. Product used

OPTIWAVE 1540

- Radar level transmitter for basic applications with liquid chemicals and open channel flow
- Cost-effective non-contact level measurement in chemical tanks at low pressure (up to 5 bar / 72.5 psi) and low temperature (up to 80°C / +176°F)
- 80 GHz radar, Lens Antenna
- Measuring range: 0...15 m / 49.2 ft



Contact

Would you like further information about these or other applications?
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