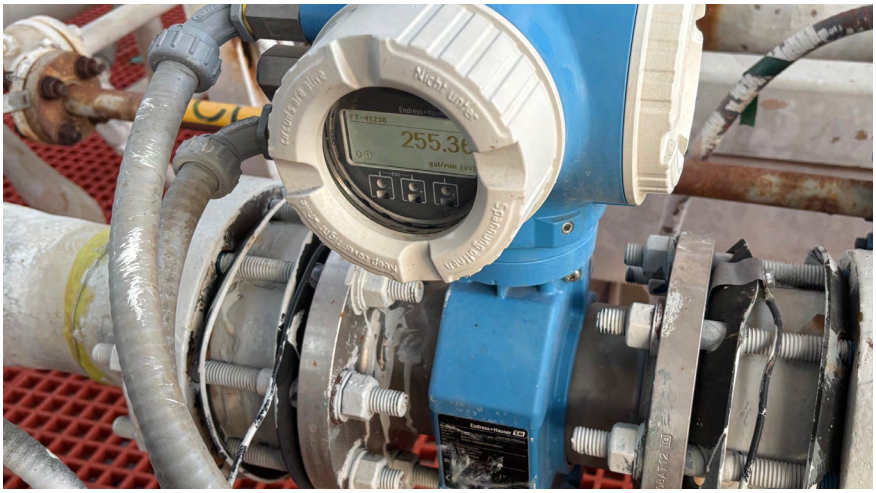
Enhancing chlorine production reliability with Proline Promag P 300 electromagnetic flowmeter

How one company improved its electrolysis process

Olin

Benefits at a glance

- Process efficiency through accurate flow data
- Reduced downtime due to the elimination of erratic readings and false alarms
- Lower maintenance costs
- Improved safety and confidence in measurement readings



Summary: Headquartered in Clayton, MO, Olin Corporation is a global chlor-alkali producer with one of the largest chlorine capacities in the world. The company's product portfolio consists of vinyl, chlor-alkali and epoxy products, designed to provide its customers with the most reliable solutions.

In the heart of Olin Corporation's chlorine production facility in Plaquemine, Louisiana, a long-standing challenge was quietly disrupting efficiency—unreliable flow measurements caused by extreme electrical interference. For decades, standard electromagnetic flowmeters struggled to deliver consistent readings in this high-voltage environment, forcing operators to rely on workarounds and endure costly inefficiencies. That changed when Olin collaborated with Endress+Hauser to trial the Proline Promag P 300 flowmeter. Designed with Floating Measurement technology, the Proline Promag P 300 not only withstands harsh conditions faced in chemical plants, but also delivers the accuracy, reliability and confidence Olin needed to optimize its processes and plan for the future.

Challenge: At the center of Olin's Plaquemine facility is a complex

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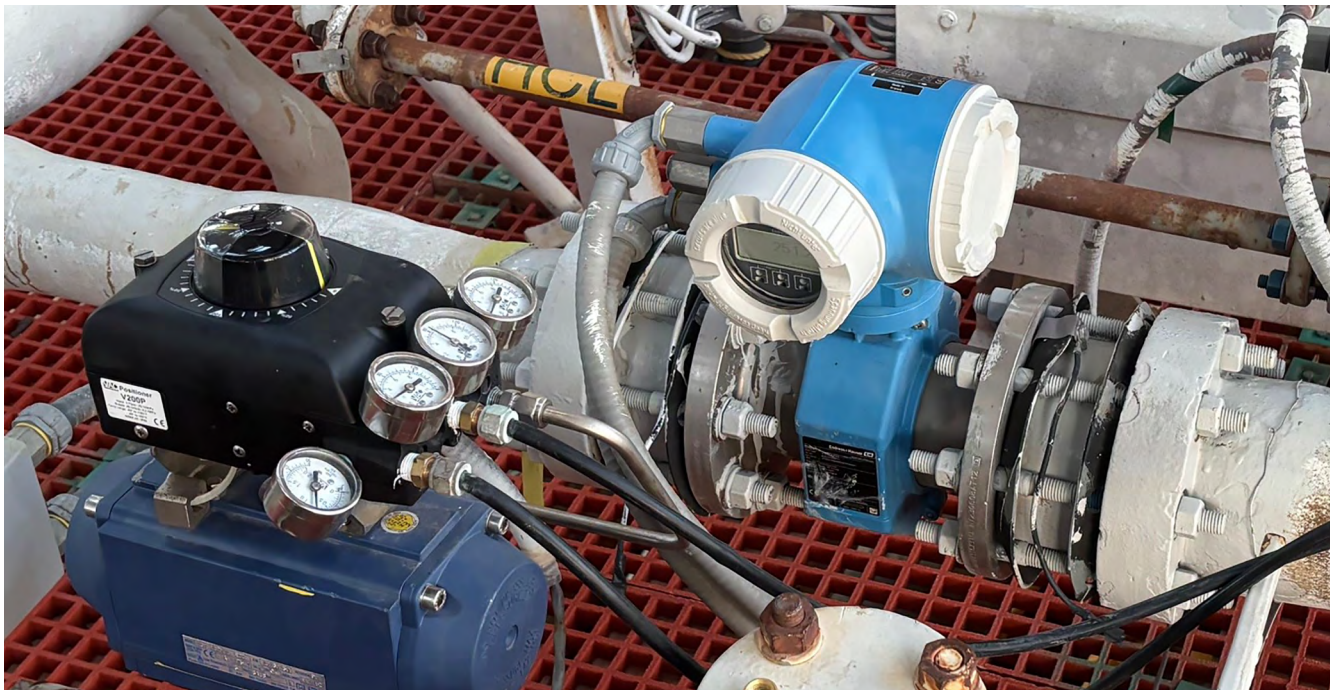

electrolysis process that transforms raw brine (saltwater) into chlorine, hydrogen and caustic soda. This process operates up to 850 volts DC and 72,000 amps—conditions that generate intense stray currents throughout the fluid and piping. These conditions historically create challenges for standard electromagnetic flowmeters, damaging grounding electrodes and causing erratic readings and frequent maintenance issues.

Electromagnetic flowmeters operate based on Faraday's Law of Electromagnetic Induction, which states that a voltage is induced when a conductive fluid flows through a magnetic field. In these flowmeters, a magnetic field is generated perpendicular to the direction of flow within a non-metallic pipe. As the conductive liquid moves through this field, it induces a voltage proportional to the flow velocity. Electrodes positioned on the pipe wall detect this voltage, which is then converted into a flow rate. Since the measurement is based on the fluid's velocity and not mechanical components, electromagnetic meters are ideal for applications involving dirty, corrosive or viscous fluids, offering high accuracy and minimal maintenance. A common requirement for electromagnetic flow measurement is proper grounding of the flowmeter to an earth ground to ensure the meter is isolated from stray electrical noise, and protect the meter from galvanic corrosion.

In Olin's chlorine production process, flow measurement is critical: insufficient flow can prevent proper chemical mixing, reduce efficiency and trigger alarms or shutdowns. The Louisiana-based chlorine production facility also faced persistent challenges with electromagnetic flowmeters in its high-voltage environment. The plant struggled with erratic flow readings caused by stray currents—issues that compromised process efficiency and potentially damaged grounding electrodes, triggered false alarms and forced operators to rely on workaround solutions. Standard electromagnetic flowmeters with grounding rings were particularly vulnerable, often corroding or failing under the extreme conditions of the chlorine plant's electrolysis process. Grounding to Earth potential isn't possible in most electrolysis processes, and alloy selections for these applications can be expensive.

Prior to installing Endress+Hauser's Proline Promag P 300, Olin's team had to implement a workaround—using valve position as a proxy for flow—to maintain process reliability.

Our solution: To address these challenges, Olin collaborated with Endress+Hauser to trial the Proline Promag P 300 electromagnetic flowmeter equipped with Floating Measurement technology. This innovative design eliminates the need for traditional grounding rings, significantly reducing susceptibility to stray currents and interference.

The Floating Measurement option achieves this by isolating the measuring circuit of the electromagnetic flowmeter from the rest of the sensor body and transmitter. The potential of the process medium is picked up by a reference electrode and supplied to the amplifier. This electrical potential is used as the reference. At the same time, the amplifier is electrically isolated from the ground potential of the power supply. This prevents harmful equalizing currents, which would have a negative influence on the measurement result, or lead to damage to electrodes from galvanic corrosion. In conjunction with Heartbeat

Technology, Proline Promag P 300 also supplies additional process information, allowing the electrical potential of the medium to be measured and output as a measured value.

The electromagnetic flowmeter was installed in one of the plant's most challenging areas with strong electrical currents present, creating a harsh environment.

Results: Endress+Hauser's Proline Promag P 300 electromagnetic flowmeter delivered immediate and sustained improvements in measurement stability, process control and operational confidence. Unlike previous flowmeters that frequently spiked or dropped to zero due to interference, Proline Promag P 300 provided consistent, accurate flow readings across all operational phases — startups, shutdowns and steady-state production. This reliability enabled Olin to consider reverting to flow-based control logic, which they had previously stopped using because of unreliable data.

By eliminating the need for grounding rings, the flowmeter avoided the corrosion and electrical interference that challenged previous installations. As Olin engineer Carson Berthelot noted, "We don't require ground rings with it. That's reduced cost and reduced risk of leaks or failures." The flowmeter was installed in a location with one of the highest magnetic field strengths in the plant. Despite this, the Proline Promag P 300 delivered stable, accurate readings. "I could tell within the first couple of weeks that it was looking good," said Olin process expert Tory Hebert. "It wasn't going to spike, and it seemed to be unaffected by the stray currents in the system."

Over the course of a year, the flowmeter was monitored through multiple production cycles. The data confirmed what the team had observed early on: consistent performance, even in the face of extreme electrical interference.

"We try to order every flowmeter with Heartbeat Technology. We're excited about the additional insights we'll be able to gain."

Michael Beck
Instrument Technology Leader, Olin

Encouraged by the success of the trial, Olin is now considering a broader rollout of the Proline Promag P 300 across its chlorine production units. With more than a dozen electromagnetic flowmeters in service, the potential for improved reliability and reduced maintenance is significant.

As the plant transitions to a new control system, the team also plans to leverage Endress+Hauser's Heartbeat Technology for enhanced diagnostics and predictive maintenance. "We try to order every flowmeter with Heartbeat Technology," said Olin Instrument Technology Leader Michael Beck. "We're excited about the additional insights we'll be able to gain."

Olin's experience with the Proline Promag P 300 flowmeter underscores the value of innovation, collaboration and trust. In one of the most challenging environments for flow measurement, Endress+Hauser delivered a solution that not only met expectations but exceeded them — enabling Olin to operate more efficiently, safely and confidently.

Learn more about Endress+Hauser's Proline Promag P 300

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