INOVANCE

Automation case study

Reducing spillage with anti-sloshing technology

A success story with Inovance's solution

Customer profile

A pioneer in packaging since 1990, this company is renowned for its innovative approach and commitment to quality. Headquartered in West Yorkshire, UK with manufacturing facilities in India, it offers a wide range of packaging solutions across industries such as food and beverage, pharmaceuticals, and consumer goods. Its strengths lie in its innovation, customer-centric approach, commitment to quality, and corporate social responsibility.

The company is renowned for its:

- Flexible packaging (e.g., pouches, bags, films)
- Rigid packaging (e.g., containers, bottles, jars)
- Custom packaging (tailored to specific client needs)
- Sustainable packaging (recyclable and biodegradable options)

The challenge

In the highly competitive filling and packaging machine industry, Original Equipment Manufacturers (OEMs) like them face several challenges:

- Precision and efficiency: Accurate positioning of containers to prevent spillage and waste during the filling process.
- Innovation and customization: Adapting machines to client-specific needs.
- Cost effectiveness: Offering high-performance machines while maintaining affordability.
- Compliance: Meeting regulatory and safety standards.
- Global competitiveness: Staying ahead with technological advancements and sustainable practices.

The paint container filling machine presented a specific challenge due to the need for precise container positioning and seamless conveyance through different stages of the filling process. The customer required a solution that could improve efficiency while ensuring the accuracy of filling to prevent paint spillage.

The solution

Inovance Technology collaborated with the customer to address these challenges.
Inovance supplied a comprehensive motion control solution for the paint container filling machine:

- Controller: AM401-CPU1608TP-INT
- Servo drive: SV660NT8R4I-INT
- Servo motor: MS1H2-20C30CD-A331Z-INT

This solution offered a high-performance, cost-effective system with features that significantly improved the operational efficiency of the filling machine:

- Precise positioning: The servo motor-driven conveyor accurately positioned containers under the filling nozzles, minimizing the risk of spillage and ensuring consistency in the filling process.
- Ethernet/IP communication: Integration with SCADA systems via Ethernet IP protocol enabled real-time monitoring and control, enhancing automation and data visibility.
- Smooth and efficient operation: The EtherCAT-based motion control system facilitated smooth and high-speed movement, reducing the risk of bottlenecks and jams in the production line.
- Anti-sloshing algorithm: Inovance's servo motion controller featured an anti-sloshing algorithm, preventing liquid (paint) from spilling due to sudden movements by optimizing the motion profile.
- Vibration suppression library: The AM401 controller included a specialized library function block for vibration suppression, which reduced vibrations during acceleration and deceleration. This technology minimized the vibration of specified resonance frequency and supress slides and spilling, improving production speed.
- Safety: The servo system included the STO (Safe Torque Off) functional safety function, ensuring compliance with industrial safety standards.

The benefits

By implementing Inovance's solution, customers experienced several advantages. The precise container positioning and smooth movement enhanced overall production line efficiency, minimizing downtime from jams or bottlenecks. The anti-sloshing feature of the servo motion profile cut down on spillage, leading to cost savings and a cleaner facility. Inovance's system achieves comparable performance to existing solutions but at a lower cost, with high responsiveness and built-in safety features. Additionally, the integration of EtherCAT and SCADA systems provided improved control and flexibility, optimizing operations and offering real-time insights into machine performance.

Key benefits

- Increased efficiency
- Enhanced control and flexibility
- Minimized spillage
- Cost-effective solution

The conclusion

Inovance Technology's partnership with the customer has resulted in a highly efficient and precise paint container-filling solution. Inovance's advanced servo motor and motion control system not only improved the performance of the filling machine but also ensured cost-effectiveness, safety, and reliability. This case demonstrates how innovative automation solutions can overcome industry challenges and drive operational excellence.