CASE STUDY

Sykell & Avery Dennison

AVERY DENNISON

Scaling circularity:
Leading the reuse evolution!

Unlike traditional manual or QR-based processes, RFID enables rapid scanning of many items at once, providing real-time data on inventory and returns, more precise stock management and streamlining the scheduling of washing and redistribution cycles.

In response to growing environmental concerns and sustainability regulations, the retail and food service sectors are offering their customers reusable packaging options to reduce single-use. However, making these systems efficient and widely adopted has posed significant operational challenges, such as high labor costs, slow processing times, and limited real-time inventory tracking.

Sykell, a startup dedicated to circular packaging solutions, partnered with Avery Dennison to address these hurdles by piloting RFID (Radio Frequency Identification) technology to manage reusable foodware for Rewe, one of the largest food retailers in Europe.

This case study details how RFID integration improved key areas, as a powerful tool for labor reduction, bulk processing, real-time inventory accuracy, visibility, and operational efficiency. While foodware today leverages serialized QR codes, the proof-of-concept demonstrates the added value of RFID technology. This collaborative approach is paving the way for scalable, sustainable change throughout the food retail industry.

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Introduction

For all companies, the journey from a brilliant concept to a scalable industrial operation is often the most challenging. Sykell is on a mission to eliminate single-use packaging waste by creating a truly circular system for food retailers. Their vision is clear: **turn packaging into a renewable resource that consumers and businesses can use seamlessly.**

Evolving regulations now require food retailers to offer reusable packaging options, presenting a major opportunity for Sykell to accelerate industry-wide compliance and adoption. Sykell manages reusable foodware, leveraging its expertise in circular systems to support the transition to sustainable operations.

However, moving millions of reusable containers between consumers, retailers, and washing facilities requires a logistics backbone that is both efficient and sustainable.

Through the AD Stretch program, Sykell partnered with Avery Dennison to prove that sustainability **doesn't have to mean slowing down**.

Together, we embarked on a pilot project to replace manual, one-by-one scanning with automated RFID batch scanning — combining Sykell's reuse expertise with Avery Dennison's leadership in digital identification technology to effectively streamline inventory counting and data capture.

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The problem

To drive sustainable change at scale, reuse systems must be highly efficient.

Sykell's initial system for Rewe relied on serialized QR codes for tracking, but this process involved manual labor and time-consuming tasks. As reusable foodware circulation rapidly increased, it became clear that the existing approach risked slowing progress and keeping costs high. Better automation and real-time inventory visibility were essential to meet regulatory requirements and support Sykell's goal of growing tenfold in the coming years.

Additionally, Sykell faces challenges tied to limited real-time visibility in inventory and returns. The absence of robust item-level tracking also makes it challenging to identify which stores need additional incentives or support to increase return rates.

The rising circulation of reusable foodware within Sykell's system at Rewe — currently estimated at 1.5 million items, with the potential to increase tenfold — meant these inefficiencies risked scaling along with the operation. To meet both regulatory requirements and Sykell's ambitious expansion goals, a breakthrough was needed to automate processes, improve real-time system visibility and reduce both labor and operational costs for mass adoption.

Each returned container had to be individually scanned at multiple points in the reverse logistics chain — from collection at the Rewe store to clearing and commissioning at Sykell's facility. This item-by-item scanning created several challenges:

HIGH LABOR COSTS

The process was labor-intensive, requiring employees to handle and scan each container individually.

PROCESS BOTTLENECKS

Manual scanning slowed down the entire workflow, particularly during the clearing and commissioning stages.

DELAYED INVENTORY VISIBILITY

The time lag between a container's return and its registration in the system meant Sykell had limited real-time insight into its inventory levels.

Sykell needed a solution to automate its processes, reduce operational costs, and increase the speed and adoption of its reuse system. The existing manual and QR-based system hindered scalability and created bottlenecks in clearing and commissioning, burdening staff with repetitive tasks, and delaying both inventory visibility and store credits. Furthermore, limited real-time insight made stock planning difficult and slowed expansion.

Streamlining these workflows and delivering quicker credits became essential not only for compliance but for winning over franchisees, attracting other retailers, and supporting the ambition to scale from 1.5 million vessels in use to tens of millions nationwide.

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The solution

Sykell and Avery Dennison launched a pioneering pilot project to prove the value of integrating RFID technology into the existing reuse workflow. **The objective was to build a data-backed case study demonstrating RFID's efficiency compared to the QR-only system.** The pilot incorporated several new features that address key operational and financial challenges:

Accelerated Clearing and Commissioning

By integrating RFID at the clearing (inspection) and commissioning stages, both processes are now significantly faster. The technology enables bulk scanning of crates or entire pallets, automating data capture and reducing the need for manual intervention.

Improved Labor Efficiency

The system now achieves at least a 25% faster clearing process and a 50% accelerated commissioning process. In simulated operational settings, two employees can process up to 12 pallets per day—double the previous capacity.

Accurate, Real-Time Data & Inventory Planning

RFID provides Sykell with greater visibility into the process, enabling better scheduling in the washing facilities, optimized inventory management, and more accurate regional order fulfillment for retail partners.

Financial Transparency & ROI

Detailed tracking of vessel cycles and return rates supports transparent ROI calculations. With more than 80% of vessels returning, ROI is achieved in under four cycles.

Scalability & Compliance

The flexible design supports expansion beyond Rewe, allowing other retailers to comply with new German regulations and encouraging future system-wide adoption.

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With these innovations, the pilot not only addressed Sykell's most pressing operational issues but also created a robust foundation for scaling the reuse model industry-wide.

Avery Dennison RFID labels were applied to a controlled batch of Sykell's reusable foodware. The pilot followed the journey of these containers from their arrival at the washing facility through the steps of counting, washing, and preparing them for reuse.

The new, RFID-enabled process introduced several key improvements:

1 BULK SCANNING

Instead of scanning individual QR codes, employees could now scan entire boxes or even full pallets of containers simultaneously using RFID readers. This eliminated the most significant bottleneck in the process with nearly 100% accuracy.

2 AUTOMATED DATA CAPTURE

The RFID system automatically captured data for batches of containers, creating an immediate and accurate record of returned items.

3 REAL-TIME VISIBILITY

As containers passed through the facility, their status was updated in near real-time, giving Sykell an accurate picture of its "dirty" and "clean" inventory.

By replacing item-by-item manual work with efficient, automated bulk scanning, the RFID solution was designed to transform the operational workflow.

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The result

The pilot project delivered significant, quantifiable improvements, confirming the impact of RFID technology on reverse logistics. The results exceeded expectations and built a powerful business case for a full-scale rollout. The key outcomes included:

+30% reduction in labor costs

By automating manual scanning, the RFID solution delivered substantial savings on labor.

33% increase in clearing speed

The time-consuming process of registering dirty returned items was significantly accelerated. What previously took two minutes per box was reduced by 30 seconds.

50% increase in commissioning speed

Preparing clean containers for redistribution became faster, with processing time per box cut by approximately 1.5 minutes.

Exceptional read accuracy

Full pallet scans achieved 99.5% read accuracy, providing reliable, near-real-time inventory data that enabled better production planning.

Rapid return on investment (ROI)

The simulation, based only on labor savings at the washing facility, showed that the ROI for integrating RFID is achieved in under four cycles, assuming an 80% return rate for the vessels.

Next steps

Beyond streamlining processes, the pilot will now address a key technical challenge in the reusable foodware sector: microwave heating. Standard RFID tags often fail when exposed to microwave heat, which presents a challenge, as food containers are often microwaved by mistake. To address this, the pilot will implement microwave-safe RFID tags. These innovative tags are designed with consumer safety in mind, ensuring they remain secure and functional even if a container is mistakenly microwaved.

RFID integration also holds another significant potential: enhancing store-level validation. In the future, stores can be equipped with RFID readers, enabling precise tracking and counting of vessels before they are sent to the washing facility, improving stock level management and streamlining washing schedules for greater efficiency. An optimized workflow enables faster and more reliable retailer crediting, setting the stage for instant reimbursement. This approach eliminates the current processing delay — an important advancement that accelerates widespread adoption of the system.

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Conclusion

The Sykell and Avery Dennison pilot sets a new benchmark for scalable, efficient, and sustainable packaging. By incorporating RFID technology, the system delivers significant advantages over QR code-only solutions. Unlike QR codes, RFID enables faster, hands-free scanning and real-time tracking, drastically reducing labor costs and boosting processing speed. With proven results and a replicable approach, this collaboration showcases how advanced technology can solve today's operational challenges, while forging a path ahead for industry-wide transformation.

Moving forward, Sykell is equipped with the insights to expand this advanced solution to other major food grocers, turning its ambitious vision into tangible action.

By empowering businesses like Sykell, Avery Dennison is helping build a more sustainable future where packaging is a truly circular resource.

Ready to shape tomorrow today?
If you are a mission-driven startup looking to scale your impact through innovation and partnership, learn more about how we can collaborate.

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