

PERFECT INVENTORY PROMISE | 2026

The New Economics of Retail Shrink Reduction

How Real-Time Inventory Intelligence Closes the Margin Gap



Executive Summary

\$132B

global retail shrinkage (2024)

1.6%

average retail shrink rate
(2023-NRF)

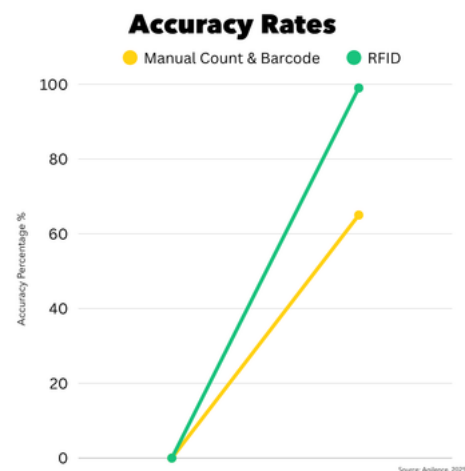
99%

inventory accuracy with RFID

Retail shrinkage is a growing margin crisis. Global retail losses reached \$132 billion in 2024 (Capital One, 2024). Against margins that can sit below 2 percent in many formats, a shrink rate of 1.6 to 2 percent is not a manageable overhead. For many retailers, it rivals or exceeds total profit.

Conventional loss prevention tools are reactive by design. They measure loss after it occurs. The root cause, receiving discrepancies, phantom inventory, and administrative error, originates at intake. ECR Retail Loss reports that over 60 percent of inventory records are inaccurate, and that inaccuracy begins at the receiving dock, not the shop floor.

RFID-enabled inventory verification at intake intercepts loss at the source. Shipments are verified against purchase orders in real time. Vendor discrepancies are flagged on arrival. Inventory records are accurate from the moment stock enters the building. RFID raises inventory accuracy from 65 to 75 percent under barcode-based systems to 95 to 99 percent consistently across deployed environments (Auburn RFID Lab, cited in Agilence, 2025).



The financial case is direct. A 40 to 50 percent reduction in shrink, consistent with current deployment evidence, recovers between £1.8 million and £2.25 million annually for a £300 million operator. VDC Research confirms that technology-led loss prevention including RFID delivered more than \$15 billion in recovered U.S. retail revenue in 2024 to 2025 alone (VDC Research, 2025).

Zebra Technologies' 18th Annual Global Shopper Study (2025) found that 84 percent of retail decision-makers cite real-time inventory synchronisation as a top priority, and 54 percent plan to implement RFID within five years. The investment case is not theoretical. The retailers acting on it are already outperforming peers on margin protection.

Abstract

Global retail shrinkage reached an estimated \$132 billion in 2024, with shrink rates averaging 1.6 percent of total sales across the sector (Capital One, 2024; NRF, 2023). Against margins under sustained pressure across retail, shrinkage is not a peripheral concern but a direct threat to commercial viability. This whitepaper introduces the Perfect Inventory Promise framework: a practical, measurable operating model through which Zebra Technologies and ClarityRFID enable retailers to move from reactive shrink management to real-time inventory intelligence. It examines how RFID-enabled inventory verification at the point of intake addresses the structural origins of retail shrink, with reference to current deployment evidence, recent industry research, and the financial model that makes the investment case self-funding from the first phase of deployment.



The **margin crisis** hiding inside your inventory record

Retail shrinkage is not a marginal operational irritant. It is a material cost line, and it is getting worse.

The National Retail Federation's 2023 Retail Security Survey recorded a U.S. average shrink rate of 1.6 percent of total retail sales, representing \$112.1 billion in losses and an increase of more than \$18 billion on the prior year (NRF, 2023). Globally, shrinkage is estimated to have reached \$132 billion in 2024 (Capital One, 2024). And the problem compounds: McKinsey estimates that poor stockout management and shrink together drain up to 5 percent of potential top-line sales annually in retail (McKinsey, cited in Inventorfid, 2025).

The operating context makes this harder to absorb with each passing year. Labour shortages are constraining the teams responsible for receiving, counting, and replenishment. Consumer expectations for real-time availability and omnichannel fulfilment are rising. And the cost of not knowing what is actually in the building, whether stock exists, where it sits, and whether the record is accurate, compounds across every unfilled shelf, every mis-picked order, and every unexplained variance that cannot be attributed by Friday.

The cost of not knowing

Every unfilled shelf is a lost sale. Every phantom inventory record is a broken promise. Every manual count is time your team is not spending on the floor. The cost is not just in what is lost. It is in every decision made on data that is wrong.

Conventional loss prevention responses, including CCTV, EAS tags, manual receiving checks, and periodic audits, were designed for a different operating environment. They are reactive by design: they measure or deter loss after or during the event. In the case of process-driven shrink, which originates in receiving discrepancies, phantom inventory, and administrative error, they often fail to identify root cause at all.

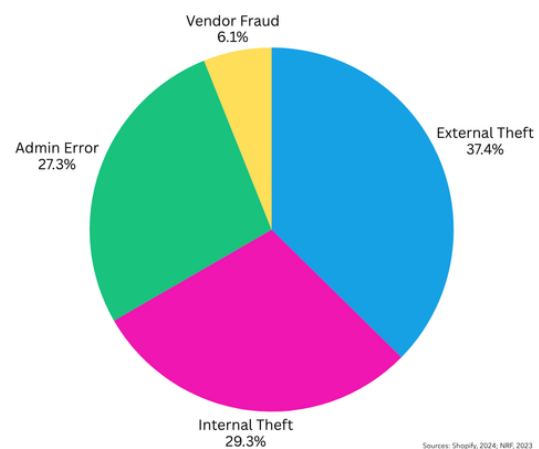
RFID-driven receiving accuracy, deployed at the point of intake, provides a structurally different mechanism. It intercepts loss at the moment it originates. This whitepaper explains how, and why the commercial case for acting is stronger now than at any point in the last decade.

The anatomy of retail shrinkage: where loss begins

Understanding where shrinkage originates is a prerequisite for selecting tools capable of reducing it. Industry data consistently identifies four primary categories: external theft (shoplifting and organised retail crime), internal theft (employee fraud), administrative error (process failures, miscounts, mislabelling), and supplier or vendor fraud (short shipments, substitutions, falsified credits).

The NRF's 2023 Retail Security Survey found that external theft accounts for 37 percent and internal theft for 29 percent of total loss. Administrative errors account for a further 27 percent, with vendor fraud contributing approximately 5 to 6 percent of the remainder (NRF, 2023; Shopify, 2024; Wifitalents, 2026). Administrative error alone is estimated to represent \$20 billion of total annual retail loss (Wifitalents, 2026).

What creates shrinkage loss?



Incorrect inventory counts during receiving represent an estimated 8 percent of supply chain shrink, and paperwork errors are cited by 21 percent of retailers as a top-three cause of inventory discrepancy (Wifitalents, 2026). Research from ECR Retail Loss, whose community includes more than 400 major global retailers, reports that over 60 percent of inventory records are inaccurate, and that this inaccuracy originates primarily at the receiving stage rather than at the point of sale (ECR Retail Loss, 2025).

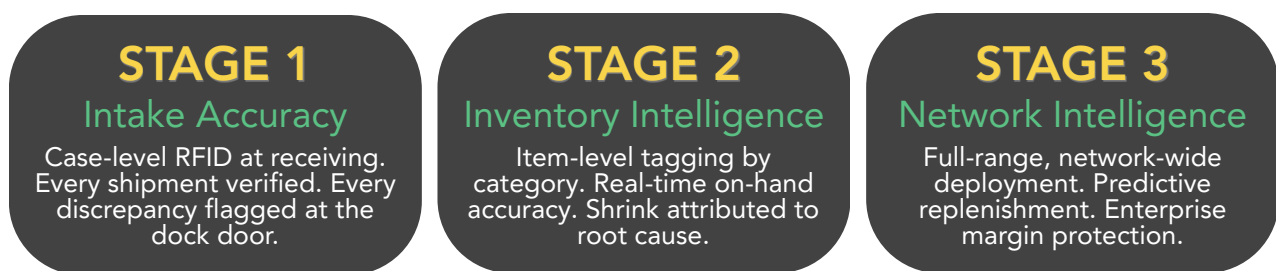
“By the time a discrepancy becomes visible on the shelf or in a cycle count report, it has typically already been carried in the inventory record for days or weeks as stock the business believes it holds but does not.”

A shrinkage problem that begins at intake cannot be resolved by surveillance at the shelf edge. The intervention must occur upstream. That is the structural premise of the Perfect Inventory Promise framework.

The Perfect Inventory Promise framework

The Perfect Inventory Promise is not a product. It is an operating model. It describes the shift from reactive shrink management, measuring loss after it occurs, to real-time inventory intelligence: a continuous, item-level view of what stock exists, where it is, and whether the record is accurate, from the moment product enters the receiving dock through to the shelf edge and beyond.

The framework has three stages, each building on the last.

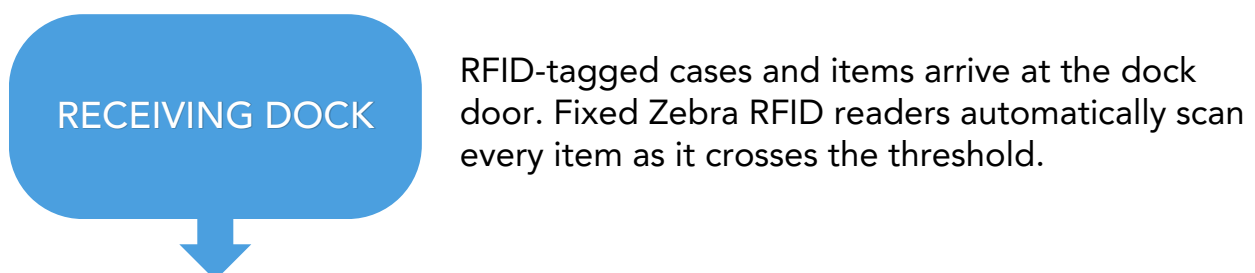


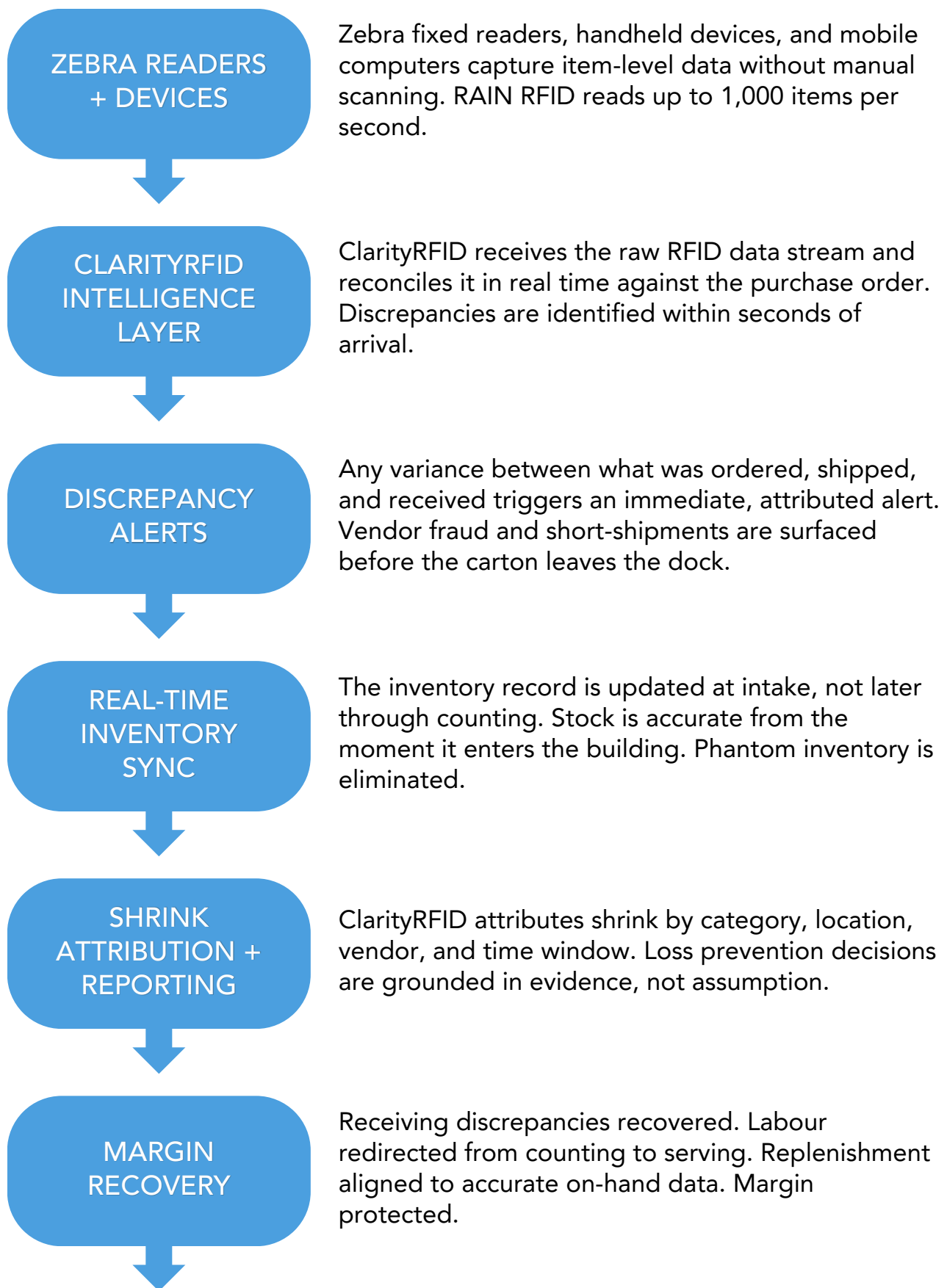
Each stage is commercially self-justifying before the next begins. Stage 1 generates the data that builds the business case for Stage 2. Stage 2 produces the evidence base for Stage 3. No stage requires a full-estate commitment before it delivers return.

The retailers already operating at Stage 3 are not those who waited for the perfect moment to commit to everything at once. They are the retailers who started at the dock, measured what changed, and scaled from evidence.

How the Perfect Inventory Promise works: the operating model

The operational flow of the Perfect Inventory Promise framework moves in seven steps, each building on the last to transform raw RFID signal into actionable margin intelligence.





Zebra captures what is happening. ClarityRFID turns that signal into visibility, insight, and confident action. The partnership is not incidental to the model. It is the model.

Why Zebra Technologies + ClarityRFID

Most RFID implementations stall not because the technology fails, but because hardware and software are sourced, integrated, and supported in isolation. Readers without intelligence produce data no one acts on. Software without enterprise-grade hardware cannot scale across complex retail environments.

Zebra Technologies and ClarityRFID address both sides of that problem as a single, integrated solution.

Zebra Technologies

Enterprise-grade **RFID hardware** trusted by over 80 percent of the Fortune 500.

- Fixed and handheld RFID readers and antennas
- Mobile computers and enterprise tablets with integrated RFID
- RFID printers and smart label encoders
- Global deployment scale across 100+ countries

ClarityRFID

The **software intelligence** layer that turns RFID reads into operational action.

- Real-time item identity and movement tracking
- Shipment verification and vendor compliance enforcement
- Shrink attribution and loss reporting
- Deployed across 9,000+ stores and DCs in 14 countries

Together, the partnership delivers deployment simplicity, enterprise scalability, and measurable inventory outcomes. Zebra's RFID 2026 strategy, presented at its RFID Roadshow and Forum in May 2026, centres on the convergence of RFID, software, and AI to enable what Zebra describes as ambient intelligence: a continuous, real-time layer of operational awareness across the retail environment (Zebra Technologies, 2026).

ClarityRFID is purpose-built to sit at that intersection, turning Zebra's hardware capability into the inventory intelligence retailers need to protect margin at scale.

“With AI, automation, and improved workflows, retailers can reduce loss and deliver the fast, seamless, and personalized experiences that today's shoppers demand.”

- Zebra Technologies

Evidence from current deployments

What the data shows

The evidence base for RFID-driven shrink reduction has matured considerably in recent years, moving beyond early controlled studies into operational deployment data from major retail environments.

Industry-wide inventory accuracy

According to the Auburn RFID Lab, traditional inventory methods including manual counts and barcode scanning typically produce accuracy rates of 65 to 75 percent. RFID implementation raises this to 95 to 99 percent consistently across deployed environments (Agilence, 2025). At 93 percent adoption among North American retailers as of late 2024, the competitive landscape is shifting against operators who remain on manual systems (Accenture, cited in Agilence, 2025).

RFID as a loss prevention foundation

VDC Research's 2025 Loss Prevention Report found that shrink declined from 2024 to 2025, delivering more than \$15 billion in recovered revenue for U.S. retailers. More than 90 percent of retailers surveyed said real-time inventory accuracy is essential to their loss prevention goals, and 93 percent see value in integrating RFID with loss prevention platforms (VDC Research, 2025).

Retail deployment: Zebra + ClarityRFID in action

In 2024, Zebra Technologies reported growing adoption of RFID-enabled loss detection in retail, with each reader interaction creating an automated record of product identity, location, time, and value. Randy Dunn, Director of Customer Success at Zebra Technologies, noted that RFID has become the technology of choice for inventory visibility, operational efficiency, product traceability, and loss prevention across retail environments (RFID Journal, 2024).

A 2023 to 2024 deployment by apparel brand Selmark, scaling a pilot across its full supply chain with RFID tagging at source, achieved 30 percent gains in picking, shipping, and receiving efficiency, demonstrating the direct operational impact of RFID verification at intake (RFID Journal Live, 2025). ClarityRFID deployments across more than 9,000 stores and distribution centers in 14 countries have consistently delivered 99.5 percent inventory accuracy, 85 percent faster cycle counts, and 50 percent reductions in shrinkage.

RFID adoption momentum

The global RFID market is projected to grow from \$17.12 billion in 2025 to \$37.71 billion by 2032, with RFID return on investment forecast to nearly double from 11 percent in 2023 to 20 percent by 2032 (Accenture, cited in Agilence, 2025; HFA, 2025). Zebra Technologies' 18th Annual Global Shopper Study (2025), surveying more than 4,200 respondents globally, found that 84 percent of retail decision-makers cite real-time inventory synchronisation as a top organisational priority and 54 percent plan to implement RFID within five years to improve inventory visibility and reduce shrinkage (Zebra Technologies, 2025).

“RFID has become a technology of choice for inventory visibility, operational efficiency, product traceability, expiration management, and food safety.”

- Zebra Technologies

The financial case: from operational metric to budget line

For operations leaders, the commercial framing of the RFID investment case matters as much as the operational evidence. The argument that RFID improves inventory accuracy is correct but insufficient to drive capital commitment at board level. The argument that RFID directly reduces a cost line the business is already absorbing and already reporting to senior leadership is structurally different.

Shrinkage is, in most retail businesses, a named line item in the profit and loss account. It is measured. It is reported. And in the current environment, characterised by margin pressure, rising operational costs, and declining investor appetite for uncontrolled loss, leadership is actively seeking mechanisms to reduce it.

The financial model

A retailer with annual revenues of \$408 million) and a shrink rate of 1.5 percent is absorbing \$6.1 million of shrinkage annually. A 40 percent reduction in that rate generates \$2.45 million of annual margin recovery. At 50 percent reduction, the recovery reaches \$3 million. The implementation cost is recovered from the shrink reduction alone. Labour savings and fulfilment accuracy gains are additive.

This framing repositions RFID from a technology investment requiring IT sponsorship to a margin protection investment requiring finance and operations alignment. That repositioning is often the decisive factor in moving from pilot to deployment.

RFID systems' typical return on investment has increased from 11 percent in 2023 to a forecast of nearly 20 percent by 2032 (HFA, 2025). For retailers deploying now, the compounding benefit of early adoption, in recovered shrink, in labour efficiency, and in competitive inventory accuracy, represents a window that narrows with each quarter of inaction.

MYTH: RFID only works when every item is tagged.

REALITY: Many successful deployments begin with tagged cases, selected categories, or targeted operational workflows. Retailers can generate measurable improvements in receiving accuracy, inventory visibility, and shrink reduction long before full-assortment tagging is achieved.

Implementation: the phased path to Perfect Inventory

For retailers with limited current RFID adoption, the Perfect Inventory Promise framework provides a phased implementation model that is commercially defensible at every stage. Full-range deployment from day one is neither necessary nor optimal. Each phase is designed to generate the evidence that funds the next.

Stage 1: Intake Accuracy. Case-level RFID at receiving.

Fixed Zebra RFID readers at dock doors verify every incoming shipment against the purchase order. Discrepancies are flagged in real time. This stage requires no change to in-store operations and generates immediate, attributable data on receiving accuracy and vendor compliance. The data produced at Stage 1 builds the business case for Stage 2.

Stage 2: Category Intelligence. Item-level tagging of high-value and high-shrink categories.

Using Stage 1 data to identify where shrink exposure is most concentrated, item-level tagging is introduced selectively. ClarityRFID transforms item-level reads from Zebra devices into real-time inventory records, shrink attribution reports, and replenishment intelligence. This is the stage at which inventory accuracy moves from receiving verification into live, item-level visibility for the categories that matter most to the P&L.

Stage 3: Network Intelligence. Full-range, network-wide deployment.

With proof-of-concept established and financial returns documented across Stages 1 and 2, deployment extends to the full product range and to additional sites in the network. At Stage 3, the Perfect Inventory Promise is operational: a continuous, item-level inventory intelligence layer that eliminates phantom inventory, reduces shrink, accelerates fulfilment, and protects margin across the entire estate.

The software layer is non-negotiable throughout. Hardware alone does not reduce shrinkage.

Zebra devices capture what is happening; ClarityRFID turns that signal into flagged discrepancies, real-time inventory records, vendor compliance reports, and shrink attribution analysis.

The combination delivers what neither component achieves alone.



Frequently asked questions

What percentage of retail shrinkage can RFID realistically reduce?

VDC Research's 2025 Loss Prevention Report attributed more than \$15 billion of recovered U.S. retail revenue to technology-led loss prevention strategies including RFID (VDC Research, 2025). ClarityRFID deployments have consistently delivered 50 percent shrinkage reductions across more than 9,000 stores and distribution centres. The highest gains are attributable to Stage 1: receiving accuracy eliminates the process-driven discrepancies that account for up to 33 percent of total shrink.

Do retailers need to tag every product before they see a return?

No. Stage 1, case-level RFID at receiving, generates measurable financial returns without item-level tagging of any product. Stage 2 extends those returns through selective category deployment. The business case for the Perfect Inventory Promise framework does not require full implementation before it is justified.

How does RFID differ from barcode-based receiving?

Barcode systems require individual line-of-sight scanning and manual operation, which limits throughput at receiving and introduces human error as a structural variable. RAIN RFID reads up to 1,000 items per second at distances of up to 10 metres without manual intervention (ScanTexas, 2025). This is the operational difference that makes intake-point shrink interception viable at retail scale.

What is driving retailers to adopt RFID now, specifically?

Three forces have converged. First, RFID tag costs have fallen to a level that makes deployment commercially viable across a wider range of categories than previously possible (Avery Dennison, 2024). Second, margin pressure has reached the point where shrink reduction is operationally urgent rather than aspirational. Third, 93 percent of North American retailers are already using RFID in some capacity, meaning inaction is no longer a neutral competitive position (Accenture, cited in Agilence, 2025).

How does ClarityRFID work with Zebra hardware?

Zebra RFID readers, mobile computers, and enterprise tablets capture item-level data across the retail environment, from dock door to store floor. ClarityRFID receives that data stream and transforms it into actionable inventory intelligence: discrepancy alerts, real-time on-hand accuracy, shrink attribution by category and vendor, and replenishment signals. The integration is purpose-built. Zebra devices are the signal; ClarityRFID is what the signal means.

Summary: margin protection is an operational choice

The cost of shrinkage in retail is not abstract, and it is not inevitable. It is a measurable cost line, growing in absolute terms year over year, inside a sector where the margin available to absorb it continues to compress.

RFID deployed at the point of intake addresses the categories of loss that conventional tools are structurally incapable of reducing: receiving discrepancies, phantom inventory, administrative error, and vendor non-compliance. These are not secondary causes of retail shrink. They are the categories most directly connected to the inventory accuracy problem that underlies every unfilled shelf, every misallocated replenishment order, and every variance that cannot be explained by the end of the trading week.

The Perfect Inventory Promise framework, delivered through the partnership of Zebra Technologies and ClarityRFID, provides a practical, phased, commercially self-funding path from reactive shrink management to real-time inventory intelligence. The retailers already operating on this model are outperforming their peers on margin protection. The retailers moving toward it are closing the gap.

“The commercial case for RFID is no longer theoretical. Zebra Technologies and ClarityRFID have demonstrated that item-level inventory accuracy is achievable, measurable, and self-funding from the first phase of deployment. The question is not whether it works inside your operation. The question is how quickly you validate it.”

VALIDATE THE BUSINESS CASE IN 30 DAYS

The ClarityRFID team offers qualified retail operators a structured RFID Proof of Concept designed to validate the business case and quantify shrink reduction and inventory accuracy improvements in 30 days or less. A measurable pilot designed to quantify inventory accuracy improvements and shrink reduction opportunities before committing to full-scale deployment.

Apply at clarityrfid.com/perfect-inventory



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