

## APPLICATION SPOTLIGHT

# Ultra-low-cost intelligence for product authentication

## Build trust and confidence in your brand with Pragmatic FlexICs

Commercial-scale counterfeiting costs businesses trillions of dollars each year<sup>1</sup>. But beyond financial loss, counterfeiting also undermines trust and – in the case of foodstuffs and medicine – poses a real risk to consumer health. The ability to track, verify and maintain security of goods as they make their way through the supply chain is vital. But, due to cost, digital authentication has typically been reserved for high-value items.

Pragmatic supports brand protection every step of the way with ultra-low-cost, flexible integrated circuits (FlexICs) that make it quick and easy to embed intelligence almost anywhere.

Durable and shock resistant, with a lower environmental footprint than traditional chips, FlexICs underpin RFID-based smart solutions to provide item-level traceability – and a compelling opportunity to make widescale, low-cost authentication a reality.

### How do FlexICs protect brand integrity?

By enabling real-time, item-level monitoring of goods in transit, FlexICs help to prevent tampering, diversion, and counterfeiting, by allowing readers to ‘talk’ to goods, verifying their origin, and their integrity. This provides the data needed to spot inconsistencies that may indicate product diversion, or potential counterfeit hotspots, and helps measure the impact of counterfeiting on your brand.

### Do I need new infrastructure to use them?

Typically, no. FlexIC-enabled RFID tags can be read by most commercial readers, as well as the vast majority of Android smartphones.

### Key challenges

- **Cost**  
Authentication at scale has, until now, proved prohibitive for all but high-value items, due to high unit cost
- **Limited options for application**  
Traditional solutions can struggle to cope with thin or curved surfaces, limiting their application
- **Environmental impact**  
Amid increasing scrutiny, the case for adding intelligence ‘everywhere’ must be balanced against the environmental cost

### Benefits of FlexICs

- **Ultra-low-cost intelligence**  
FlexICs cost just a fraction of traditional smart chips, making deployment at scale attainable
- **Physical flexibility**  
Thanks to their physical flexibility, FlexICs can be applied almost anywhere, opening up new possibilities for smart authentication
- **Lower environmental footprint**  
FlexIC production typically uses just a fraction of the power and water of silicon chip manufacture. It also significantly reduces the quantity of chemicals and gases consumed

---

## How do they work?

FlexICs are just 30 microns thick – thinner than a human hair – so sit comfortably within standard RFID inlays and labels. Alternatively, they can be embedded within a product. Their physical flexibility and ultra-thin form means you can add intelligence almost anywhere – even on curved or domed surfaces – without impacting product aesthetics.

---

## How durable are they?

As part of reusable packaging, FlexIC-enabled RFID inlays have been tested against typical industrial wash protocols, withstanding myriad wash cycles without losing adhesion or functionality.

---

## Can FlexICs they give consumers peace of mind?

Yes. Embedded into product or packaging, FlexICs give consumers incontrovertible proof of authenticity, as well as an easy way to obtain in-depth product information, receive offers and advice, leave reviews or give feedback.

---

## Can they help with auditing?

They can. By enabling documentation of the complete product history, from manufacture and storage to transportation FlexICs support robust compliance with regulatory requirements – and allow inspectors to instantly identify genuine products.

In the case of integrity issues, accurate location information lets you swiftly retrieve the affected items, without needing to recall an entire shipment.

---

## Do they support monitoring across the cold chain?

Yes. Used with condition sensors, they can safeguard the integrity of temperature-sensitive goods, such as perishable foodstuffs and medicines, ensuring that thermal standards are maintained during transportation.

---

## What about return logistics?

The unique item-level traceability provided by FlexICs is indispensable for streamlined return logistics, underpinning efficient scheduling of collections, product categorization and location management.

---

## What else can they do?

By providing insights into the condition and location of goods in transit, FlexICs allow prediction of supply deficits and operational bottlenecks, enabling accurate management of stock levels across the distribution chain.

Find out more: [www.pragmaticsemi.com/](http://www.pragmaticsemi.com/)



FlexICs make it cost-effective to add intelligence to a wide range of products and packaging



Their physical flexibility makes them extremely versatile



They enable item-level traceability, helping to spot inconsistencies...



...identify potential counterfeit hotspots ...



... and maintain security of goods in transit.