# RAIN RFID
## Makes Supply Chains More Sustainable

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Sometimes, business goals and environmental goals go hand in hand.

RFID tags have been with us since the 1970s, but only recently have they gained the power to help us reduce our impact on nature. Maximizing the effectiveness of our globally integrated supply chains and minimizing waste are an absolute environmental necessity – and that's where RAIN RFID comes in.

In a nutshell, RFID tags are smart labels that make physical objects visible in the digital world. This not only enables IoT applications of all kinds, but it's also especially useful in inventory management and other applications for optimizing supply chains.

RAIN RFID (a unique ultra-high frequency, passive technology) has the longest readability range and the lowest per-unit cost, and allows for tracking the identity, location and authenticity of each product, enabling transparency and traceability throughout supply chains.

The RAIN Alliance is a group of companies that have come together to create a smarter and more sustainable world using RAIN RFID technology, creating a positive effect that ripples through our global economy.

### Adoption

RAIN RFID is being used in retail, healthcare, food, logistics and transportation, aviation, IoT, smart manufacturing, EU road charging, electric vehicle identification and registration, electronic toll collection and other smart city applications.

More than 21 billion items were RAIN-enabled at source in 2020, and analysts expect that this number will climb to trillions of items by 2030. We're right on track, despite the effects of the pandemic: RAIN RFID tag integrated circuit (IC) shipments reached over 28 billion in 2021, representing a 36% increase over 2020, and a CAGR of over 25% is projected to 2026.

RAIN is also cost-effective. VDC estimates inlay unit prices of $0.04 USD in 2021, with unit prices projected to drop to $0.039 by 2026.

### Bringing Sustainability to RFID — and to Supply Chains

Governments, consumers, investors and businesses are all looking for ways to reduce our carbon footprint and waste and improve

our reusability and recyclability. RAIN RFID helps us get closer to these goals in two important ways.

## A More Environmentally-Friendly RFID Tag

RAIN RFID tags are passive, in contrast with active RFID tags which are battery-powered. Avoiding the use of batteries alone is a massive sustainability win, but the advantages of RAIN go much further.
Most RFID tags include metal (often aluminum), plastic, and an adhesive. RAIN RFID tags can be made with paper instead of plastic, and with a biodegradable adhesive.

Some varieties of RAIN RFID tags are also manufactured in facilities that are energy-efficient, lowering the overall carbon footprint for the fabrication of the label by 40%. We've also made steps towards circularity: for some labels, the excess aluminum used during manufacturing can now be fully recycled and the paper re-pulped.

Our RAIN Alliance Sustainability Workgroup is also keeping a close eye on the research into transfer and ink-jet printers as well as nano technologies to produce smaller, lower cost, and even more eco-friendly RAIN tags. They're also looking at how RAIN tags can be made using only biodegradable material, and the use of graphene and similar non-metals as an alternative to aluminum. As processes become proven, the RAIN Alliance will be spearheading their adoption.

## Enabling More Sustainable Supply Chains

While the tags themselves are now more eco-friendly, the potential sustainability impact of RAIN RFID is greatest in how it brings visibility to supply chains, enabling reductions in their environmental footprint. In the food industry, for example, temperature and humidity sensors in RAIN RFID tags can help producers and logistics teams keep perishable food in better conditions, reducing waste. In retail, RAIN RFID can reduce waste, improve fiber recycling in clothing and other textiles, and provide end-of-life information to consumers. Considering that the fashion industry is the "second largest polluter in the world and accountable for 10% of the world's carbon emissions" according to one researcher, the potential impact in this industry alone is very exciting. These are just a few examples.

## Developing a Better Way

It won't be long before a trillion items are RAIN RFID-enabled and consumers can interact with RAIN RFID via their phones. They'll be able to learn about the history of a product, and verify that it's compliant with modern anti-slavery, environmental and other important standards before they buy.

I truly believe that the inherent usefulness, great user experience and simplicity of RAIN RFID tags have the ability to change the world. I'm proud to lead an organization that's transforming so many industries for the better.

Join the *RAIN Alliance*, contribute to the Sustainability Working Group and make a difference in the industry.