

Avery Dennison Smartrac  
Quick Guide  
January 2023

# RFID Labels for Logistics



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## Why RFID?

### RFID increases accuracy, building on the legacy of barcode

Barcodes and RFID are being used extensively in receiving, putaway, pick, QC, and dispatch operations in the warehouse, to maximize accuracy, efficiency and traceability.

While barcoding is still the dominant tracking technology in warehouse operations today, RFID use will no doubt take over dominance in the future. This will essentially enable “connected logistics” that allow warehouse operators to accurately automate all on-site functions, thus becoming more nimble and resilient.

### Four major pressures

- **Increase capacity:** Move more products through the current facility footprint delay expansion capex.
- **Accuracy:** Heightened inventory accuracy / integrity and tracking. Flawless delivery – correct item(s) to the correct destination.
- **Velocity / speed:** The need to move products faster and more efficiently in order to meet today’s consumer demands.
- **Labor efficiency:** Growth drives increases in demand, resulting in labor and logistical challenges. Highly efficient pick, pack, ship processes are required.

### Maximize use of current capacity

As labor, space, and inventory challenges continue, we are seeing growth in the use of RFID to enable automation in the warehouse, which optimizes exploitation of existing capacity. RFID tagging gives items an individual digital ID, which transforms them into the “things” of the Internet of Things. The internet side resides in applications like WMS and ERP, which drive automation and analytics with this more accurate tracking data.

### Operational speed through complete transparency

A key aspect to supply chain resiliency is having full transparency on authenticity, inventory, and location. Of course, this transparency includes accuracy and timeliness. This is why we see RFID-enabled goods digitally connected to IoT applications driving not only supply chain transparency, but also driving further value in the form of increased efficiency, automation and analytics.

### Labor and process optimization

Connected logistics delivers accurate and timely data on goods flowing through the supply chain, removed from human error and delay. This data not only reduces labor from removed manual scanning, but is also now trusted to further automate shipping, storage, fulfillment and other logistics operations. This accurate data can also be used for predictive and post-process analytics to mitigate process bottlenecks or make late-binding logistics changes. These are pillar attributes to a more resilient supply chain, and enable the optimized deployment of personnel.

### Use cases



Freight



Warehouse



Parcel

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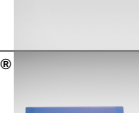
## Why Avery Dennison?

- The broadest product range for any RFID challenge.
- Most reliable and durable products ensuring consistent quality and performance.
- Valued services that help grow your business.
- Global network to expand your knowledge and capability.

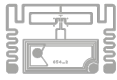









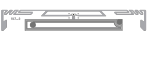


## Our RFID product recommendations

Product name	Design (not to scale)	Antenna dimensions	Chip	EPC and user memory	TID memory	Delivery format	Applications
AD-23X		70 x 14.5 mm 2.76 x 0.57 in	NXP UCODE 9	96-bit EPC	96-bit / 48-bit unique serial number	Dry inlay Wet inlay Label / sticker	Case Larger item RTI level tracking
AD-23X Pure		70 x 14.5 mm 2.76 x 0.57 in	NXP UCODE 9	96-bit EPC	96-bit / 48-bit unique serial number	Dry inlay Wet inlay Label / sticker	Case Larger item RTI level tracking
AD-23x Slim		70 x 10.5 mm 2.75 x 0.413 in	NXP UCODE 9	96-bit EPC	96-bit / 48-bit unique serial number	Dry inlay Wet inlay Label	Case Larger item RTI level tracking
AD-239		0 x 14.5 mm 2.76 x 0.57 in	Impinj M730 Impinj M750	128-bit EPC 96-bit EPC and 32-bit user memory	96-bit / 48-bit unique serial number	Dry inlay Wet inlay Label / sticker	Case Larger item RTI level tracking
AD-325		42.5 x 17 mm 1.67 x 0.67 in	Impinj M730 Impinj M750	128-bit EPC  96-bit EPC 32-bit UM	96-bit / 48-bit unique serial number	Dry+ inlay Wet inlay Label / sticker	Case Parcel Item level tracking
AD-327 ETSI		41 x 16 mm 1.63 x 0.63 in	NXP UCODE 9	96-bit EPC	96-bit / 48-bit unique serial number	Dry inlay Wet inlay Label / sticker	Case Parcel Item level tracking
AD-327 ETSI Pure		41 x 16 mm 1.63 x 0.63 in	NXP UCODE 9	96-bit EPC	96-bit / 48-bit unique serial number	Dry+ inlay Wet inlay Label / sticker	Case Parcel Item level tracking
AD-327 FCC		42.5 x 17 mm 1.67 x 0.67 in	NXP UCODE 9	96-bit EPC	96-bit / 48-bit unique serial number	Dry+ inlay Wet inlay Label / sticker	Case Parcel Item level tracking
AD-366 Dual UHF + EAS		73.1 x 37.7 mm 2.877 x 1.484 in	NXP UCODE 9	96-bit EPC	96-bit / 48-bit unique serial number	Label / sticker	Case Parcel Item level tracking
AD-387		50 x 30 mm 1.18 x 1.97 in	NXP UCODE 9	96-bit EPC	96-bit / 48-bit unique serial number	Dry inlay Wet inlay Label / sticker	Case Parcel Item level tracking
AD-681		50 x 50 mm 1.97 x 1.97 in	Impinj Monza 4D	128-bit and 32-bit	96-bit / 48-bit unique serial number	Dry inlay Wet inlay	Pallet RTI MHE level tracking Omnidirectional performance
AD-681		50 x 50 mm 1.97 x 1.97 in	Impinj Monza 4QT	128-bit and 512-bit	96-bit / 48-bit unique serial number	Dry inlay Wet inlay	Pallet RTI MHE level tracking Omnidirectional performance
AD Belt		70 x 14 mm 2.76 x 0.55 in	NXP UCODE 9	96-bit EPC	96-bit / 48-bit unique serial number	Dry inlay Wet inlay Label / sticker	Case Larger item RTI level tracking
AD Belt		70 x 14 mm 2.76 x 0.55 in	Impinj M730 Impinj M750	128-bit EPC 96-bit EPC and 32-bit user memory	96-bit / 48-bit unique serial number	Dry inlay Wet inlay Label / sticker	Case Larger item RTI level tracking





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AD Belt		70 x 14 mm 2.76 x 0.55 in	NXP UCODE G2iL	128-bit EPC	64-bit / 32-bit unique serial number	Dry inlay+ Wet inlay+	Automotive Logistics
AD Belt DF		70 x 20 mm 2.76 x 0.79 in	EM4425	2048-bit	Available	Label / sticker	RTI Customer engagement
AD Dogbone		94 x 24 mm 3.7 x 0.9 in	NXP UCODE 9	96-bit EPC	96-bit / 48-bit unique serial number	Dry inlay Wet inlay Label / sticker	Pallet RTI MHE level tracking
AD Dogbone		94 x 24 mm 3.7 x 0.9 in	Impinj M730 Impinj M750	128-bit EPC 96-bit EPC and 32-bit user memory	96-bit / 48-bit unique serial number	Dry inlay Wet inlay	Pallet RTI MHE level tracking
AD Maxdura® Brick ETSI		39 x 13 x 5.3 mm 1.54 x 0.51 x 0.2 in	Alien Higgs 3	96-bit and 512-bit	64-bit unique serial number	Hardtag double sided tape	Durable asset Tracking returnable Transport items Material handling equipment On metal
AD Maxdura® Brick FCC		39 x 13 x 5.3 mm 1.54 x 0.51 x 0.2 in	Alien Higgs 3	96-bit and 512-bit	64-bit unique serial number	Hardtag double sided tape	Durable asset Tracking returnable Transport items Material handling equipment On metal
AD Maxdura® Disc		Ø 15 mm 0.59 in	EM4237	1024-bit	64-bit unique serial number	Hardtag	Asset tracking Returnable transport items Supply chain management
AD Maxdura® Disc		Ø 30 mm 1.18 in	NXP ICODE SLIX	896-bit	64-bit unique serial number	Hardtag	Asset tracking Returnable transport items Supply chain management
AD Maxdura® Disc		Ø 50 mm 1.97 in	NXP ICODE SLIX	896-bit	64-bit unique serial number	Hardtag	Asset tracking Returnable transport items Supply chain management
AD Maxdura® Keg Dual		53 x 43 mm 2.09 x 1.69 in	Impinj Monza R6-P / NXP ICODE SLIX	128-bit and 32-bit / 2528-bit	Available	Hardtag	Supply chain management On-metal asset tracking Industrial applications
AD Maxdura® Long Range		150 x 25 x 12 mm 5.91 x 0.98 x 0.47 in	Impinj Monza 4E	496-bit and 128-bit	96-bit / 48-bit unique serial number	Hardtag	Durable asset Tracking returnable transport items Material handling equipment On metal
AD Maxdura® Outdoor ETSI		90 x 34 x 7 mm 3.54 x 1.34 x 0.28 in	Alien Higgs 3	96-bit and 512-bit	64-bit unique serial number	Hardtag	Durable asset Tracking returnable transport items Material handling equipment On metal
AD Maxdura® Outdoor FCC		90 x 34 x 7 mm 3.54 x 1.34 x 0.28 in	Alien Higgs 3	96-bit and 512-bit	64-bit unique serial number	Hardtag	Durable asset Tracking returnable transport items Material handling equipment On metal

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Product name	Design (not to scale)	Antenna dimensions	Chip	EPC and user memory	TID memory	Delivery format	Applications
AD MedioWeb DF		45 x 28.5 mm 1.772 x 1.122 in	EM4425	96-bit / up to 480-bit	96-bit (UHF) / 64-bit (HF) overlapping	Dry+, Label	RTIs, Cardboard box, Medical device
AD Midas Flagtag		34.41 x 18 mm 1.36 x 0.71 in	NXP UCODE 8	128-bit EPC	96-bit / 48-bit unique serial number	Wet inlay	On metal Liquid Item level tracking
AD Midas Flagtag		34.41 x 18 mm 1.36 x 0.71 in	Impinj M730 Impinj M750	128-bit EPC 96-bit EPC and 32-bit user memory	96-bit / 48-bit unique serial number	Wet inlay	On Metal Liquid Item level tracking
AD Midas Flagtag DF		48 x 31.4 mm 1.890 x 1.236 in	EM4425	96-bit / up to 480-bit	96-bit (UHF) / 64-bit (HF) overlapping	Label	On Metal use cases Customer engagement
AD Miniweb ETSI		42 x 16 mm 1.65 x 0.63 in	NXP UCODE 9	96-bit EPC	96-bit / 48-bit unique serial number	Dry inlay Wet inlay Label / sticker	Case Parcel Item level tracking
AD Miniweb FCC		42 x 16 mm 1.65 x 0.63 in	NXP UCODE 9	96-bit EPC	96-bit / 48-bit unique serial number	Dry inlay Wet inlay Label / sticker	Case Parcel Item level tracking
AD Miniweb Global		42 x 16 mm 1.65 x 0.63 in	Impinj M730 Impinj M750	128-bit EPC 96-bit EPC and 32-bit user memory	96-bit / 48-bit unique serial number	Dry inlay Wet inlay Label / sticker	Case Parcel Item level tracking
AD Miniweb FCC		42 x 16 mm 1.65 x 0.63 in	Impinj M730 Impinj M750	128-bit EPC 96-bit EPC and 32-bit user memory	96-bit / 48-bit unique serial number	Dry inlay Wet inlay Label / sticker	Case Parcel Item level tracking
AD Shortdipole		93 x 11 mm 3.661 x 0.433 in	NXP UCODE 8	128-bit EPC	64-bit / 32-bit unique serial number	Dry inlay Wet inlay Label / sticker	Case Parcel RTI level tracking
AD Skyline		54 x 25 x 1.8 mm 1.13 x 0.98 x 0.07 in	NXP UCODE 7XM	448-bit and 2,048-bit	96-bit / 48-bit unique serial number	Wet inlay	On metal Liquid Item level tracking
AD Slim DF		74.2 x 10.7 mm 2.921 x 0.421 in	EM4425	96-bit / up to 480-bit	96-bit (UHF) / 64-bit (HF) overlapping	Dry inlay Wet inlay	RTIs, medical device
AD TT Sensor Plus 2		68 x 26 x 3.5 mm 2.68 x 1.02 x 0.14 in	NXP NHS3100	12-KBytes [Flash] for logging data	7-bit hard encoded unique serial number	Individual sticker	Case Tote Item
AD Web		50 x 30 mm 1.97 x 1.18 in	Impinj M730 Impinj M750	128-bit EPC 96-bit EPC and 32-bit user memory	N/A	Dry inlay Wet inlay Label / sticker	Case Parcel Larger item level tracking

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Product name	Design (not to scale)	Antenna dimensions	Chip	EPC and user memory	TID memory	Delivery format	Applications
AD Web		50 x 30 mm 1.97 x 1.18 in	NXP UCODE 9	96-bit EPC	96-bit / 48-bit unique serial number	Dry inlay Wet inlay Label / sticker	Case Parcel Larger item level tracking
AD Squarewave		93 x 11 mm 3.661 x 0.433 in	Impinj M730 Impinj M750	128-bit EPC 96-bit EPC and 32-bit user memory	96-bit / 48-bit unique serial number	Dry inlay Wet inlay Label	Logistics Food Industrial applications
AD TracX-DCA		50 x 50 mm 1.97 x 1.97 in	Impinj M730 Impinj M750	128-bit and 0-bit	96-bit / 48-bit unique serial number	Dry inlay+ Wet inlay+ Label	Automotive Inventory Logistics
AD TracX-Strap		50 x 50 mm 1.97 x 1.97 in	Impinj M730 Impinj M750	128-bit and 0-bit	96-bit / 48-bit unique serial number	Wet inlay+ Label	Automotive Inventory Logistics



### Sustainability

Our Pure portfolio of environmentally friendly inlays include a family of UHF RFID inlay designs that feature antennas made from pure aluminum in the final inlay construction.

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**Warranty:** Please refer to Avery Dennison standard terms and conditions: [rfid.averydennison.com/termsandconditions](https://rfid.averydennison.com/termsandconditions)

**Care and handling:** RFID inlays are sensitive to ESD. Observe standard industry practices relating to electronics / RFID to keep environmental impact and static charge to a minimum.

**Applications:** This product should be tested by the customer / user thoroughly under end use conditions to ensure the product meets the particular requirements. Avery Dennison does not represent that this product is fit for any particular purpose or use. Avery Dennison reserves the right to modify, change, supplement or discontinue product offerings at any time without notice. The information contained herein is believed to be reliable but Avery Dennison makes no representation concerning the accuracy or correctness of the data.

