

RFID PLAYBOOK APPAREL



General Overview

Introduction

As part of its ongoing modernization of store operations, Kroger is moving to item level RFID technology in Apparel, Footwear and Accessories, aligning with the broader retail industry shift led by companies such as Walmart, Nordstrom, Macy's, and Dillard's. RFID has become the standard for apparel retailers seeking real-time inventory visibility and improved execution across stores and digital channels.

Industry Standards

Kroger follows all industry standards set forth by the GS1 EPC Tag Data and placement Standard, and Auburn University's ARC inlay and tag placement standards. All tagging requirements must meet these standards and should be validated through the Auburn RFID Lab ALEC Program prior to arriving in stores.

In-Scope:

All brands that are being shipped into and sold at any of our stores within the Apparel, Footwear, and Accessories categories. This includes all national and private brands.

Getting Started

Framework to integrate RFID into organization. This includes major points that should be considered; however, every company must tailor these steps to fit the needs of their business and supply chains:

- Develop an internal RFID team.
 - Engage with your packaging provider, and if needed, with an approved RFID Inlay Manufacturer.
 - Begin procurement discussions and provide forecasts to your packaging and RFID Inlay provider.
 - Begin data management and serialization discussions with your RFID packaging provider.
- Note:** Refer to the "RFID Encoding & Serialization Requirements" section for details.
- **Develop quality check process** to ensure all items are tagged per requirements in this Playbook.
 - Take advantage of identifying ways that RFID can help improve your operations and supply chain.

Select RFID Inlay Spec

Kroger references a set of inlay specifications (spec) that are performance approved from the Auburn University RFID (ARC) Lab. Refer to the chart below to see what spec has been assigned to each category.

You can only use an approved inlay from an item's associated inlay list.

Category	Inlay Spec	Approved Inlay List
Apparel	R	https://rfidlab.org/arc/spec-r.php
Shoes/Footwear	R	https://rfidlab.org/arc/spec-r.php
Accessories	R	https://rfidlab.org/arc/spec-r.php
Sunglasses	W5	https://rfidlab.org/arc/spec-w5.php
Other	Contact Auburn	Contact Auburn

Inlay Manufacturer & Packaging Resources

All product suppliers must use RFID inlays from ARC approved inlay manufacturers. The latest version of the ARC approved RFID inlay manufacturer contact information is available at <https://rfidlab.org/inlaycontacts/>.

National Brands

Any packaging resource can be used, so long as ARC approved inlays are sourced for your approved spec. A list of packaging resources is available at:

<https://rfidpackagingresources.org/rfid-packaging-providers/>

Private Brands

For Private Brands, please communicate with your merchant to ensure you meet all RFID labeling requirements. **Note:** Private label brands will exclusively **use *Integra Trim*** for RFID needs.

Primary RFID Provider: All suppliers of the following (1) dip, (2) Heart and Heritage, and (3) TRAJ3CTORY



TRAJ3CTORY

Note: Suppliers of basic items such as socks, underwear, intimates, etc., **do not have to order from Integra Trim**; however, **they must RFID tag their items** and can use other sources, such as:

- The playbook supplier list or
- Their existing RFID provider.

Identify Inlay Size

Use the largest RFID inlay size available that fits your packaging. If the smallest (Auburn approved) inlay size available does not fit your packaging, then add a generic embedded inlay hangtag or a separate paper-based sticker to your item.

Placement of RFID Tag

Please consult the GS1 US Tagging Guideline at:

<https://documents.gs1us.org/adobe/assets/deliver/urn:aaid:aem:d9f715f6-f0d6-4f32-abf3-860e2dcc5d6/Guideline-Format-And-Symbol-Placement-for-the-Electronic-Product-Code-EPC.pdf>

You may also consult the Auburn University RFID Lab Tag Placement Guideline at:

<https://rfid.auburn.edu/tagging-location-guide/>.

If your item is not represented in Placement Guideline, contact the Auburn University RFID Lab:

<https://rfidlab.org/aleccontactform/>

RFID Tagging Requirements

- **ONLY ONE RFID TAG per product.**
- RFID description data must include specific **product size and color.**
- Must be removable by the customer even if sewn into the product.
- Labels/inlays can be placed inside or integrated into packaging; however, **ONLY if the EPC symbol is visible from the outside of the packaging.**
- Tags or inlays cannot cover any text or images.
- Should not fall off the product easily.
- No staples, perforations, switches, folding, or die cuts through inlay will make the inlay unreadable.
- Follow the standard tag placement recommendation to ensure RFID readability.
- Can be used in parallel with EAS tags but **CANNOT** be used on top of each other.
- If the product could be merchandised without packaging, the tag should be attached to the item.
- No metal foils, holograms or metallic inks should be used on any packaging containing the RFID inlay. If so, you **MUST** receive the RFID Lab approval prior to bulk production of the printed packaging.
- No RFID tags placed on the bottom of polybags or boxed items, on liquids, silver or near metal/foil.

Please contact the RFID lab at <https://rfidlab.org/alecontactform/> with questions.



EPC Symbol (Required)

Any product that **has an RFID tag MUST have the Electronic Product Code (EPC) symbol** externally displayed on the packaging to indicate it is RFID tagged. The EPC symbol is critical information for customers and store associates.

If a product is **not RFID tagged**, it **CANNOT have the EPC symbol** on its packaging.

See this link for the EPC Symbol image file and related documentation:

<https://www.gs1.org/standards/epc-rfid/guidelines>



2D Barcodes (Required)

In support of Sunrise 2027 and the migration to 2D barcodes to be used for point-of-sale transactions, Kroger is requiring the use of a **GS1 Data Matrix or a QR code with GS1 Digital Link**. The 2D barcode enables the **use of the GTIN+ serial** as the product identifier **in both the RFID tag (SGTIN) and the barcode alike**. Transitioning to 2D will enable the industry to begin leveraging additional data at point-of-sale, such as the serial number, enabling instance level tracking at checkout. Please see examples below as well as the reference material for further information.

Sunrise 2027 Explained



Product ID: 614141999996

Serial: 1000001

UPC



614141999996

"01" indicates a GTIN will follow
Ensure the GTIN is 14 digits and matches your product's GTIN!

GS1 DataMatrix



(01)00614141999996 (21)1000001

"21" indicates a serial number will follow. Ensure the serial number matches that encoded into the RFID tag!

QR Code



<https://example.com/01/00614141999996/21/1000001>

Ensure your link directs a customer to a valid web page!

For more information on 2D barcodes and the Sunrise 2027 initiative, please visit:

<https://www.gs1us.org/industries-and-insights/by-topic/sunrise-2027>

See 2D barcodes at POS implementation guideline (link below, section 5) to assist suppliers on set up.

[2D Barcodes at Retail Point of Sale Implementation Guideline](#)

2D Barcode Tagging Requirements

- **A 2D barcode is mandatory** to be printed on the item label for all RFID-enabled items.
- The 2D barcode must be either:
 - **GS1 Data Matrix (with UPC and SGTIN) or**
 - **GS1 Digital Link QR Code**

- The 2D barcode must encode a **unique serialized GTIN (SGTIN)**.
- The 2D barcode must decode to the same GTIN and serial number as:
 - The RFID tag, and
 - The human-readable and linear barcode UPC (where applicable)
- **Duplicate serial numbers across items are not permitted.**
- The barcode must be scannable, legible, and meet GS1 quality standards.
- One item = one unique 2D barcode + one unique RFID serial.

Label layout example (currently being used by suppliers using RFID and 2D)

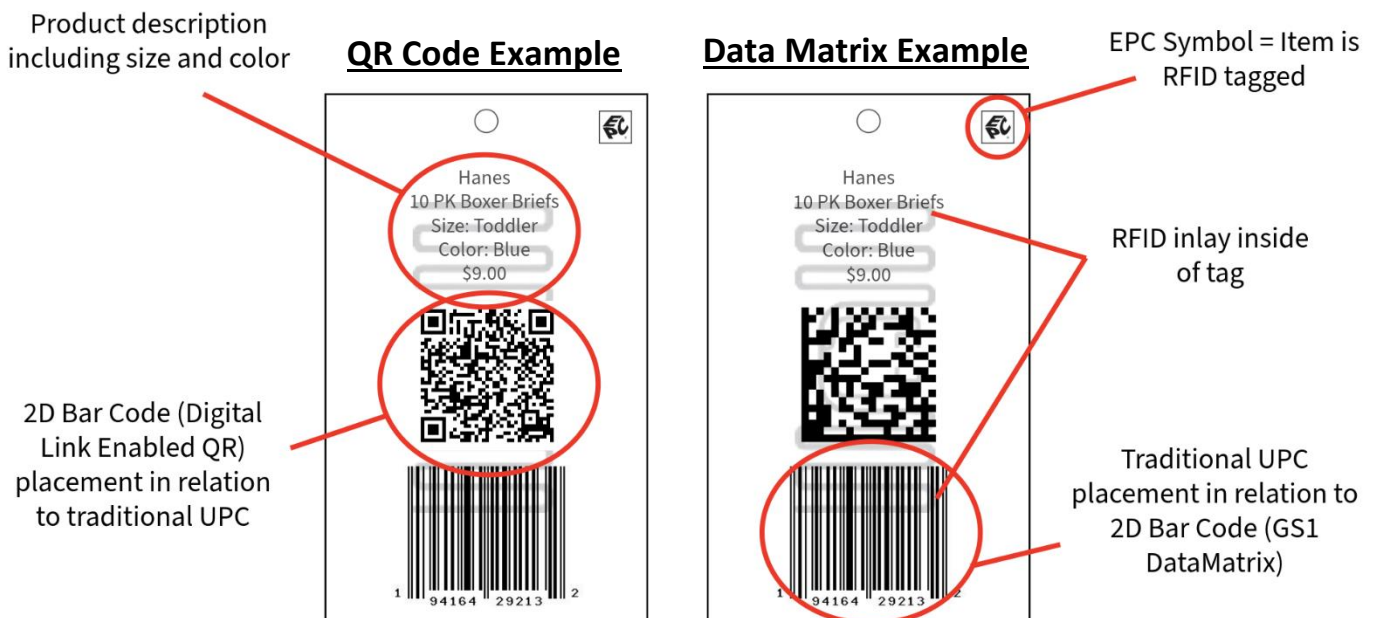


Table 5-46 Symbol specification table 1 addendum 2 for 2D barcodes

Symbol(s) specified	X-dimension mm (inches)			Minimum symbol height for given X mm (inches)			Quiet Zone	Minimum quality specification
	Minimum	Target	Maximum	For minimum X-dimension	For target X-dimension	For maximum X-dimension	Surrounding Symbol	
GS1 DataMatrix (ECC 200) (*)	0.396 (0.0150")	0.495 (0.0195")	0.990 (0.0390")	Height is determined by X-dimension and data that is encoded			1X on all four sides	1.5/12/660
Data Matrix (GS1 Digital Link URI) (ECC 200) (*) (**)	0.396 (0.0150")	0.495 (0.0195")	0.990 (0.0390")	Height is determined by X-dimension and data that is encoded			1X on all four sides	1.5/12/660
QR Code (GS1 Digital Link URI) (*) (**)	0.396 (0.0150")	0.495 (0.0195")	0.990 (0.0390")	Height is determined by X-dimension and data that is encoded			4X on all four sides	1.5/12/660

Adding a 2D barcode to an already approved Auburn ALEC submission

If your item is already approved by ALEC and you would like to add an approval for 2D barcodes, you can submit the RFID Tag and 2D Barcode samples using the Submission Update Form:

<https://rfidlab.org/submissionupdate/>.

To complete the review, you will need to send the following:

- 5 label samples, including the RFID tag and associated GS1 Digital Link QR Code / GS1 Data Matrix

Note: To be approved, the RFID tags and 2D barcodes must decode to the same UPC and serial SGTIN.

RFID Encoding & Serialization Requirements

All tags encoded per EPC Tag Data Standards (TDS), resulting in unique serialization for each item. The SGTIN-96 tag encoding standard maintained by GS1 is to be used, see example below:

$$\text{UPC} + \text{Unique Serial Number} = \text{EPC (RFID)}$$

Note: Each serial number must be unique to prevent duplicate serialization.

Please ensure unique serialization is managed when using multiple packaging providers for the same SKU. See the link below for more information.

<https://documents.gs1us.org/adobe/assets/deliver/urn:aaid:aem:5f88064e-0dbb-495b-9f29-a9ce3758caed/Developing-an-RFID-Serialization-Plan.pdf>

- **Tags must be permalocked** to prevent tampering.
- **All tags must undergo quality and data integrity checks prior to entering the supply chain.**
- The **EPC Encoder/Decoder Tool** may be found below:
<https://www.gs1.org/services/epc-encoderdecoder>

ALEC - Approval of Production RFID Samples

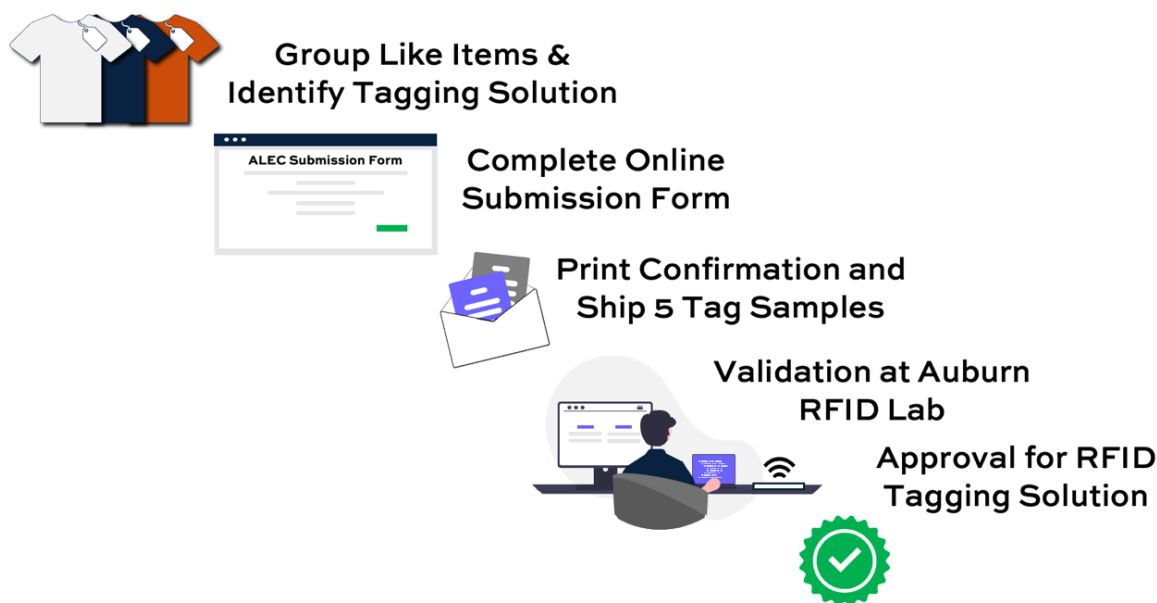
Auburn University's ALEC program helps Product Suppliers ensure their RFID tagged items meet all industry requirements. Before any shipment, you must receive RFID Lab approval. See steps below:

- Send Five (5) production quality RFID tag samples of the same UPC only (**no product or packaging**) to Auburn Lab for ALEC validation prior to bulk production. These may be branded hangtags, generic hangtags, or stickers.
- Submissions can be created at: <https://rfidlab.org/alec-submissionform/>
- Submit one representative UPC per Submission Form
 - 5 RFID Tag samples are required only for the representative UPC
- Submissions must be created for each representative UPC (SKU). Representative UPCs should share the same:

- Brand, packaging type, packaging provider, RFID inlay model, and tagging location
- Print the confirmation of your submission form after submitting and include it with your shipment of RFID tag samples.

Note: Actual product or packaging will only need to be sent when specifically requested by the RFID Lab. Any product sent to the RFID Lab will NOT be returned to the product supplier.

ALEC Submission Process Illustration



Questions? Reach the ALEC team here: <https://rfidlab.org/aleccontactform/>

Refer to the ALEC submission guide for instructions: <https://rfid.auburn.edu/alec/alec-validation.php>

ALEC - Submission Updates

- To add Kroger to an existing submission for another retailer, update inlay models, update tagging locations, add 2D barcode approval, or add additional UPCs to a submission, complete the Submission Update Form: <https://rfidlab.org/submissionupdate/>
- All submission updates should only reflect items that meet the same criteria as the representative UPC of the submission, including:
 - Product supplier, brand, packaging type, packaging provider, RFID inlay model, tagging location

Supplier Accountability

Product suppliers are required to have a process in place to ensure all tags leaving your facility are completely unique. **Quality checking** includes ensuring there are no duplicate serial numbers and that each tag is properly encoded for the item it is on.

Note: Any errors arriving at stores will be the responsibility of product suppliers and all costs incurred.

RFID Shipper Case Markings

For stores to easily identify which cases contain items that have packaging with RFID labels. The Shipper Case Markings **must include** the word **RFID**.



Carton or carton labels do not carry any RFID inlays. Only the selling unit packaging carries the RFID inlay. The RFID marking is in addition to all other case markings and should not interfere with any other printed case markings, case labels, federal and state laws, or any other compliance related markings. **If the product inside the case is not RFID labeled, do NOT use the RFID marking.** Please contact your retailer regarding any questions.

Acronym Summary

Acronym	Meaning
ALEC	Auburn Lab EPC Compliance
ARC	Arkansas (Auburn) Radio Compliance
EAS	Electronic Article surveillance
EPC	Electronic Product Code
GS1	Global Standards Organization
RFID	Radio Frequency Identification
SGTIN	Serialized Global Trade Item Number
SKU	Stock Keeping Unit
TDS	Tag Data Standards
UPC	Universal Product Code

Contacts

Auburn University RFID Lab

General Questions: <https://rfidlab.org/aleccontactform/>

ALEC RFID Tag Samples Validation Submission Form: <https://rfidlab.org/alecsubmissionform/>

Submission Update Form: <https://rfidlab.org/submissionupdate/>

Submission Tracker Tool: <https://rfidlab.org/alec-lookup/>

ARC Website: <https://rfid.org/arc/>

GS1 US

Website: www.gs1us.org

Supplier-oriented introduction to RFID: <https://site.gs1us.org/RFID-success.html>

Serialization Guide: <https://documents.gs1us.org/adobe/assets/deliver/urn:aaid:aem:5f88064e-0dbb-495b-9f29-a9ce3758caed/Developing-an-RFID-Serialization-Plan.pdf>

Tag Data Standards: <https://www.gs1.org/standards/tds>

EPC Encoder/Decoder Tool: <https://www.gs1.org/services/epc-encoderdecoder>