



# Getting Started with 2D Barcodes

## Infrastructure Questions, Key Considerations, & Resources for Brands

Industry has set a date to transition to accepting 2D barcodes at point-of-sale (POS) — referred to as Sunrise 2027. 2D barcodes allow for a single, standardized way to meet both supply chain needs and evolving consumer requirements. GS1 US® has created this step-by-step guide to help brands prepare their products to be 2D barcode enabled to better connect with their consumers and streamline operations.

### Getting Started: High-Level Infrastructure Questions for Product Packaging

1. **Barcode Selection:** Which 2D barcode types (e.g., GS1 Data Matrix, QR Codes) are most suitable for your product packaging and supply chain needs?
2. **Data Encoding:** What specific data (e.g., Global Trade Item Number (GTIN®), batch/lot number, expiration date) needs to be encoded in the 2D barcodes?
3. **Variable Data:** Will the 2D barcodes need to include data beyond the main product identifier, and will this require changes in the packaging production process?
4. **Printing Quality:** Are your printing processes and packaging providers capable of producing high-quality 2D barcodes that are easily scannable?
5. **Integration:** How will the 2D barcodes be integrated into your existing packaging and labeling processes?
6. **Futureproofing:** How will your packaging adapt to future changes in barcode standards and consumer expectations?

### Getting Started: Key Considerations

1. **Barcode Design and Placement:**
  - Ensure the barcode is placed in a location that is easily scannable and meets GS1 guidance for co-locating a 2D barcode with existing 1D barcodes on packaging.
  - Design the barcode to include necessary data elements such as GTIN, batch/lot number, and expiration date.
2. **Printing and Quality Control:**
  - Use high-quality printing techniques to ensure barcode readability.
  - Implement quality control measures to verify barcode accuracy and function.
3. **Data Management:**
  - Maintain accurate and up-to-date data for encoding in the barcodes.

- Ensure data consistency across all products and packaging.

#### 4. **Compliance and Testing:**

- Regularly test barcodes to ensure compliance with GS1 Standards.
- Conduct scanning tests to verify barcode readability in various conditions.

#### 5. **Consumer Engagement:**

- Use 2D barcodes to provide additional product information to consumers, such as ingredients, allergens, and sustainability data.
- Leverage GS1 Digital Link to connect barcodes to online resources and enhance consumer interaction.

### **Questions to Ask**

- Which 2D barcode types are most suitable for our products?
- How will we ensure the quality and readability of our barcodes?
- What data needs to be encoded in the barcodes?
- How will we integrate 2D barcodes into our existing processes?
- How will we ensure compliance with GS1 Standards?

## Roadmap to 2D: Crawl, Walk, Run Guide for Brands

Below is an incremental roadmap that brands can follow to prepare and begin their journey to 2D. GS1 US experts are here to help you along the way to understand your organization's needs, use cases, and requirements.

<b>Crawl</b> <b>Establish 2D With GTIN</b> <b>Use cases:</b> Consumer engagement, digital disclosures, sustainability information, promotions, increased loyalty/trust	<b>Walk</b> <b>Expand and Explore GTIN+</b> <b>Use cases:</b> Enhanced consumer engagement, automation, recalls, inventory/freshness management, sustainability/ESG, business insights	<b>Run</b> <b>Deepen Use and Achieve Scale</b> <b>Use cases:</b> Expanded visibility, further improved packaging, wider interoperability, returns fraud, loss prevention
<b>Brands — Realize Initial Value</b>	<b>Brands — Add More Products and Adjust</b>	<b>Brands — Fully Operationalize 2D</b>
<ul style="list-style-type: none"> <li>Label products with a 2D barcode with a GTIN along with the UPC, following symbol placement guidelines</li> <li>If you're already using QR Codes on-pack, convert encoding to GS1 Digital Link format</li> </ul>	<ul style="list-style-type: none"> <li>Reduce packaging materials and optimize text on-pack</li> <li>Based on the use case, start printing dynamic data in 2D barcodes. (e.g., expiration date, batch/lot)</li> <li>Leverage data/analytics from scans across business functions</li> </ul>	<ul style="list-style-type: none"> <li>Once retailers are fully 2D capable, begin to remove 1D UPC barcode</li> <li>Evaluate the necessary printing requirements and capabilities for dynamic data on fast-moving products, as relevant</li> <li>Explore printing innovations to support high line speeds</li> <li>Evaluate the use of other technologies to enhance 2D and GS1 data value. (e.g., RFID, machine vision, artificial intelligence, digital shelf tags)</li> </ul>

### Resources

- [GS1 Global Office Practical Guide: Start Your 2D Barcode Journey](#)

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