



# Produce Traceability Initiative Best Practices for Formatting Hybrid Pallet Labels

(Revision 2.6)

## About this Best Practice Guideline

*Best practices* are generally accepted, informally standardized techniques, methods or processes that have proven themselves over time to accomplish given tasks. The idea is that with proper processes, checks and testing, a desired outcome can be delivered more effectively with fewer problems and unforeseen complications. In addition, a "best" practice can evolve to become better as improvements are discovered. The Produce Traceability Initiative (PTI) is a voluntary U.S. produce initiative. The best practice documents are the recommendations created and agreed to by all facets of the produce industry supply chain and PTI Leadership Council.

Consent between trading partners may replace specific recommendations as long as the minimum traceability information requirements are met in good faith.

## Revision History

This section itemizes the changes from the last published Best Practice.

| <u>Version No.</u> | <u>Date of Change</u> | <u>Changed By</u>                | <u>Summary of Change</u>  |
|--------------------|-----------------------|----------------------------------|---|
| Original           | July 2009             | Created by Pallet Label Subgroup | Original Best Practice  |
| 2.4                | May 2011              | Technology Working Group (TWG)   | Changed the GS1 Application Identifiers (AI) from (01), (30), (10) to AIs (02), (37), (10)  |
| 2.5                | November 2011         | TWG                              | Added "About this Best Practice Guideline" information  |
| 2.5                | November 2011         | TWG                              | Added Revision History  |
| 2.5                | November 2011         | TWG                              | Provided clarity on the difference between the size of the GS1-128 barcode with a Serial Shipping Container Code and the size of the GS1-128 barcode size when encoding a Global Trade Item Number, Batch/Lot Number and Quantity |

| <b><u>Version No.</u></b> | <b><u>Date of Change</u></b> | <b><u>Changed By</u></b>     | <b><u>Summary of Change</u></b>  |
|---------------------------|------------------------------|------------------------------|--|
| 2.5                       | November 2011                | TWG                          | Added Best Practice Objectives and Introduction  |
| 2.5                       | November 2011                | TWG                          | Added cross-referenced terms/definitions   |
| 2.6                       | September 2014               | Implementation Working Group | Added Alternate to Applying HPL to Pallets section<br>Updated “Cross-referenced terms/definitions” section |

## **Objectives**

The goals of creating best practices for the labeling of produce pallets include:

- implementing a barcode already widely used in the food industry;
- using existing GS1 Standard data elements inside the barcode;
- minimizing the information shown on the label to attain whole chain traceability;
- determining what information is necessary on the label;
- creating labels that meet the needs of the entire supply chain; and
- providing receivers with standards from which they can build their pallet label scanning systems

## **Introduction**

The Produce Traceability Initiative (PTI) focuses on standardized, electronic tracking at the case level, rather than item level. The term “case” applies to the physical enclosure in which product is shipped and can be the form of a box, reusable plastic container (RPC), bin, bag, tote, etc. These cases are normally shipped on pallets.

The Hybrid Pallet Label is the interim means by which the produce industry is identifying contents of the pallet. It encompasses both the standard GS1 Serial Shipping Container Code (SSCC) and GS1-128 case barcodes that include Global Trade Item Number (GTIN) of Contained Trade Items, AI (02), Batch/Lot Number, AI (10) and Count of each trade item (number of cases), AI (37) of each unique composition of cases on the pallet. The SSCC provides every pallet with a unique identifier that can be linked to the contents of a pallet (Global Trade Item Number, Batch/Lot Number) and communicated electronically. Thus, all cases on the pallet can be identified by scanning the GS1-128 barcodes on a label affixed to the pallet without breaking down the pallet and scanning each case label, while also facilitating the use of the Advance Ship Notice (ASN). This interim solution is intended to support the industry as it moves towards implementing standardized GS1 identification and labeling of pallets.

This best practice document uses terms that are common to the standards community, as established by the global GS1 standards organization. The following table will assist you in cross-referencing terms used in the produce sector with the GS1 Glossary of Terms:

**Table 1: Cross-Referenced Terms/Definitions**

Listed below are terms used by the produce industry and their cross-references with the GS1 Glossary of Terms:

| <b>Sector Term</b> | <b>GS1 Glossary Term</b>        | <b>Definition</b>   |
|--------------------|---------------------------------|---|
|                    | Advance Ship Notice (ASN)       | An Advance Ship Notice (ASN) is a notification of pending deliveries, similar to a packing list. In electronic form, an ASN is an Electronic Data Interchange (EDI) transaction that provides the receiving company with advance data on shipments to better plan workloads and receipt processing.   |
|                    | Application Identifier          | The field of two or more digits at the beginning of an element string that uniquely identifies its format and meaning within the GS1 System.  |
|                    | AI (02)                         | The Application Identifier (02) indicates that the GS1 Application Identifier data field contains Global Trade Item Numbers (GTINs) of Trade Items Contained in a logistic Unit   |
|                    | AI (10)                         | The Application Identifier (10) indicates that the GS1 Application Identifier data field contains a batch or lot number. The batch or lot number associates an item with information the manufacturer considers relevant for traceability of the trade item to which the Element String is applied. The AI is variable length and encodes a maximum of 20 characters.   |
|                    | AI (37)                         | Count of trade items contained in a logistic Unit.  |
|                    | Global Trade Item Number (GTIN) | The globally unique GS1 System identification number for products and services. A Global Trade Item Number (GTIN) may be 8, 12, 13, or 14 digits in length. <u>The GTIN-14 has been selected for use in the Produce Traceability Initiative (PTI) for case level identification.</u>  |
|                    | GS1                             | The not-for-profit, neutral organization dedicated to facilitating the adoption and implementation of global standards for the improvement of supply and demand chains. GS1 is dedicated to the design and implementation of global standards and solutions to improve the efficiency and visibility of supply and demand chains globally and across sectors. The GS1 system of standards is the most widely used supply chain standards system in the world. |
|                    | GS1-128 Barcode                 | A subset of Code 128 that is utilized exclusively for GS1 System element strings. Code 128 symbols have a special start code pattern (consisting of a Start Character in the first symbol character position followed by the Function Code 1 in the second character position) to designate the data that follows will comply with GS1 System standards.  |

| <b>Sector Term</b>   | <b>GS1 Glossary Term</b>              | <b>Definition</b>   |
|--|---------------------------------------|---|
|  | GS1 Member Organization (MO)          | GS1 has Member Organizations (MOs) in more than 100 countries globally. GS1 MOs handle all inquiries related to GS1 products, solutions and services.   |
|  | Hybrid Pallet Label                   | Encompasses both the standard Serial Shipping Container Code (SSCC) encoded in a GS1-128 barcode and the case barcodes, also GS1-128s, that include Global Trade Item Number (GTIN) of Contained Trade Items, AI (02), Batch/Lot Number, AI (10) and Count of each trade item (number of cases), AI (37) of each unique composition of cases on the pallet. |
| <ul style="list-style-type: none"> <li>• Pallet</li> <li>• Non-Standard Mixed Case</li> </ul>  | Logistics Unit                        | An item of any composition established for transport and/or storage that needs to be managed through the supply chain.  |
| License Plate Number   | LPN                                   | Acronym for License Plate Number. The term refers to proprietary code numbers used in Warehouse Management Systems to reference a collection of items generally contained in a logistics unit.  |
|  | Over Wrapped Pallet                   | A pallet that has been wrapped in a protective covering – normally plastic – to keep the packages on the pallet from shifting.  |
|  | Quiet Zones                           | A clear space void of any marks surrounding the barcode symbol.   |
|  | RPC                                   | Acronym for Reusable Plastic Container  |
|  | Serial Shipping Container Code (SSCC) | The globally unique GS1 System identification number used for logistics units, such as pallets, cases, and cartons. The SSCC, an 18 digit number, acts as a “license plate” to efficiently move products from one trading partner to another.   |
| <ul style="list-style-type: none"> <li>• Pallet</li> </ul>   | Unit Load                             | One or more transport packages or other items contained on a platform making them suitable for transport, stacking, and storage as a unit.  |
| WMS  |                                       | Acronym for Warehouse Management System. The term refers to a computerized system to manage the movement and activity of product in a warehouse or distribution center.   |
| <p>NOTE: There are other GS1 Application Identifiers available within the GS1 System which can also be utilized within the GS1-128 barcode. For a full list of the GS1 Application Identifiers, please see Section 3.0 of the GS1 General Specifications. There are rules for concatenating any GS1 Application Identifier and they are covered in Section 4.11 of the GS1 General Specifications, highlighting mandatory associated AIs and invalid pairs of AIs.</p> |                                       |   |

## **Hybrid Pallet Label Basic PTI Data Elements**

Below are the recommendations for creating the Hybrid Pallet Label with basic PTI data elements.

### **Adopt GS1-128 Barcodes**

Use the GS1-128 standardized barcode to convey both the SSCC number (for those using the ASN) as well as the barcodes used to indicate GTIN, Batch/Lot Number and Quantity (for those not using the ASN) as detailed below. Your country's GS1 Member Organization (e.g. GS1 US, GS1 Canada, etc.) and other solution providers can provide technical support, including various guidance documents, for creating barcodes and verifying the print quality of barcodes.

### **Use the Recommended Hybrid Pallet Label Design**

At a minimum, the Hybrid Pallet Label should include:

- the SSCC for the pallet must be displayed horizontally on the bottom of the first label;
- all subsequent GS1-128 barcodes must be displayed horizontally (as in the examples in Figures 1, 2, 3, and 4);
- each horizontal barcode should contain three pieces of information:
  - 1) the GTIN number for that case (using the Application Identifier (AI) of (02);
  - 2) the Batch/Lot number, using AI (10); and
  - 3) the quantity of cases having the same GTIN and Batch/Lot number using AI (37); and
- if you need to print multiple pallet labels due to the amount of GTIN and Batch/Lot Number combinations on the pallet, indicate the quantity of pallet labels included on the pallet (e.g. 1 of 3) and only print the SSCC on the first label as in the examples.

See Figures 3 and 4 for sample Hybrid Pallet Labels:

Best practice is to also include the company name, displayed horizontally on the top of the label as in the examples and the term "SSCC" horizontally next to the SSCC.

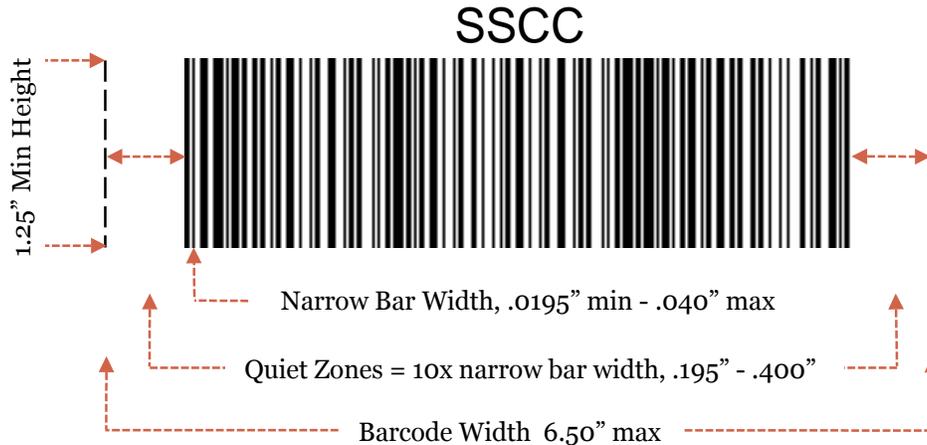
### **Recommended Label Sizes**

Pilot studies conducted by PTI participants validated the use of both 4in. x 6in. (thermal) labels and 8.5in. x 11in. (laser) labels, which are the most commonly used labels for the Hybrid Pallet Label. Which label stock is used will be an individual company decision, based on the label stock which best meets the commercial needs of the company (e.g. what equipment is already available in an operation) and which best accommodates the number of GS1-128 barcodes required on the label.

## **Recommended GS1-128 Barcode Size**

For the purposes of inclusion in the Hybrid Pallet Label, barcode size of the GS1-128 barcodes should adhere to the recommendations below.

**Figure 1: Basic GS1-128 Barcode**



## **Size of the GS1-128 Barcode When Encoding a SSCC**

- the dimensions shown above illustrate the recommended minimum size for the GS1-128 barcode;
- the total maximum length for a GS1-128 barcode printed at a narrow bar width of 0.025in. (0.635 mm) including 0.25in. (6.35 mm), 10X Quiet Zone is 6.5in. (165 mm);
- on a 4in. (102 mm) wide label, the max width of the barcode itself is 3.5in. (89 mm) plus two 0.25in. (6.35 mm) Quiet Zones brings the total width to 4in. (102 mm);
- a bar height of 1.25in. (32 mm) with a narrow bar width range of 0.0195in. (0.500 mm) to 0.040in. (1.016 mm) for the SSCC barcode; and

## **Size of the GS1-128 Barcode Used for GTIN/Lot/Quantity for Case Information**

The size of the GTIN/Lot/Quantity GS1-128 barcode is the same as the GS1-128 barcode with a SSCC, but differs from it in the following ways:

- the barcode is only intended for attended, hand held scanning applications; and
- the narrowest bar width will include the range from 0.00984in. (0.250 mm) to 0.0195in. (0.500 mm), with a minimum barcode height of 0.50in. (12.70 mm).

### **Notes:**

- the Quiet Zones are part of the symbol and are required; and

- in the illustration in Figure 1, the broken lines at either end of the symbol indicate the boundaries of the Quiet Zones and are not actually printed.

## **Use the Recommended Size of Human-Readable Information**

Information such as the GTIN, Batch/Lot Number and Quantity of identical cases should be captured in the barcode and expressed in human-readable form below the barcode. It is recommended that the numbers be presented in a font that is clearly legible from a reasonable distance within a warehouse setting.

If used, additional human-readable information – such as quantity of pallet labels on the pallet (e.g. 1 of 3) and company name – should follow the same guidance and be printed in bold for clear readability. Always keep in mind that this information may need to be read by warehouse personnel, so maximum readability (larger font size when possible) is the goal.

## **Location of the Hybrid Pallet Label**

Labels should be applied on two adjacent sides of a pallet (i.e., two sets of labels must be printed and applied to each pallet). If multiple Hybrid Pallet Labels are required to identify all the unique cases on a pallet, the labels should be stacked vertically (i.e. one above the other, not side by side). For further details, please see examples in Figures 2, 3 and 4.

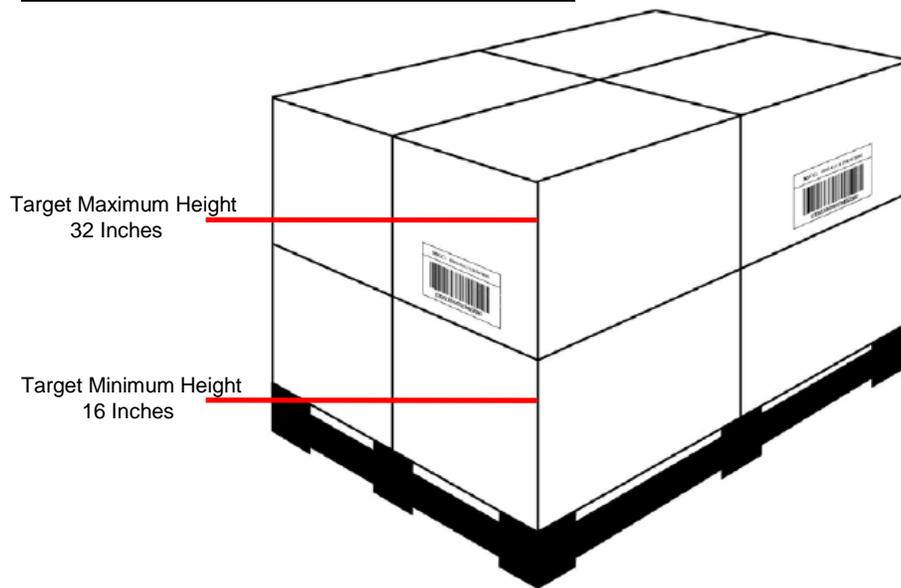
If shipping an over-wrapped pallet (e.g., wrapped in plastic), the same guidance as above applies; it is recommended the label be placed on top of the plastic, not underneath. This will ensure a better scan rate of the barcodes.

**Note:** To derive the benefits from the implementation of the ASN in the produce supply chain, the SSCC should be used in concert with the ASN, which is an electronic document sent between the shipper and the receiver to facilitate efficient receiving of product. For those companies not currently using the ASN, the Hybrid Pallet Label will ease that transition when that decision is made to start using ASNs.

## **Hybrid Pallet Labels on Pallets**

- each full unit load – one or more packages held together by a pallet, strapping, shrink-wrap, etc. – should include labels on two adjacent sides of the pallet; and
- the barcode should be placed on the upper right half of the load, but the bottom edge of the symbol should not be higher than 32in. (813 mm) and not lower than 16 in (406.5 mm) from the bottom of the unit load.

## **Figure 2: Hybrid Pallet Tag on Cases**



Target height for the bottom of the barcode is between 16 inches and 32 inches from the base of the pallet. For pallet less than 16 inches high, the barcode should be placed as high as possible while protecting the barcode.

The barcode should be right of center and at least 2in. (51 mm) from either edge. The placement refers to the shipping container barcode symbol itself, not the label.

**Note:** The recommendation to include labels on two adjacent sides of the pallet is especially helpful when the pallet is turned sideways in the truck or on the rack in the warehouse.

## **Alternate to Applying Hybrid Pallet Labels to Pallets**

This alternative method requires agreement from your trading partners before it can be adopted. The primary difference to the recommended best practice of applying the Hybrid Pallet Label to adjacent sides of the pallet is that the Hybrid Pallet Labels are printed and attached to the driver's Bill of Lading and accompany the paperwork for the load. This method requires the receiver to match the Hybrid Pallet Label to the correct pallet and therefore requires prior approval from the receiver.

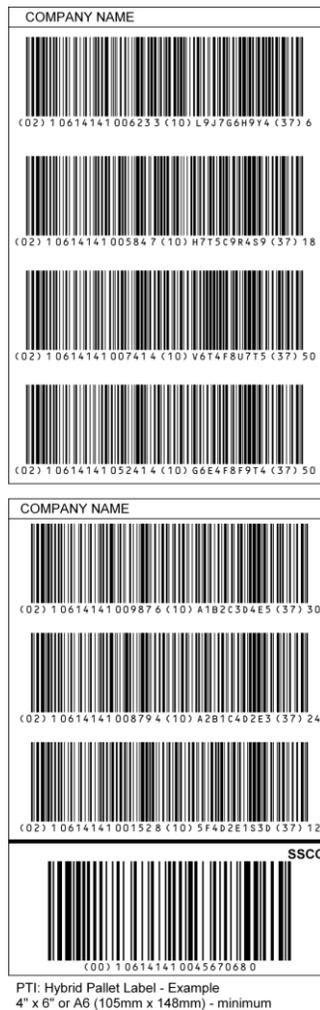
1. Apply a GS1-128 barcode encoding an SSCC to the pallet. The label should ideally be placed between 16 and 32 inches from the bottom of the pallet and at least 2 inches from the outer edge of the pallet.
2. Electronically build the pallet. i.e. scan case labels as they are going on pallet to electronically record GTIN/Lot/Quantity information.
3. Load pallet onto the truck or trailer.
4. Shipping clerk prints Hybrid Pallet Labels for each pallet on the load after it is completed.

5. Attach Hybrid Pallet Labels to Bill of Lading.
6. Receiver matches HPLs to pallet by matching the SSCC number on the bottom of the Hybrid Pallet Label to the SSCC number on the GS1-128 barcode label on the pallet.

## **Barcode Symbol Print Quality**

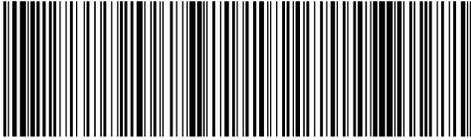
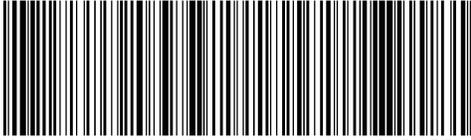
In order to be effectively used across the supply chain, the GS1-128 barcode shall conform to minimum print quality standards. Specifically, the GS1-128 barcode shall have a minimum print quality value of 1.5 or above as defined by the GS1 General Specifications and ISO/IEC 15416: “Barcode Print Quality Test Specification – Linear Symbols”. The barcode verifier used to measure print quality shall conform to ISO/IEC 15426-1: Barcode verifier conformance specification -- Part 1: Linear symbols.<sup>1</sup>

**Figure 3: Example 1 – 4in. x 6in. Hybrid Pallet Label Sample**



<sup>1</sup> For additional information on Bar Code Print Quality see AIM Layman's Guide to ANSI-CEN-ISO and Section 5.4 of ISO/IEC 15416 (2000) ED1. The AIM document can be found at: [www.aimglobal.org/](http://www.aimglobal.org/)

**Figure 4: Example 2 – 8.5in. X 11in. Hybrid Pallet Label Sample**

|   |      |
|---|------|
| COMPANY NAME  |      |
| <br>(02) 1 0614141 00987 6 (10) A1B2C3D4E5 (37) 30   |      |
| <br>(02) 1 0614141 00879 4 (10) A2B1C4D2E3 (37) 24   |      |
| <br>(02) 1 0614141 00152 8 (10) 5F4D2E1S3D (37) 12   |      |
| <br>(02) 1 0614141 00741 4 (10) V6T4F8U7T5 (37) 50  |      |
| <br>(02) 1 0614141 00584 7 (10) H7T5C9R4S9 (37) 18   |      |
| <br>(02) 1 0614141 00623 3 (10) L9J7G6H9Y4 (37) 6  |      |
| <p>PTI: Hybrid Pallet Label<br/>- Example<br/>8.5" x 11" or A4<br/>(210mm x 297mm)</p> <br>(00) 1 0614141 004567068 0 | SSCC |