Produce Traceability Initiative
Practices for Preparing to Assign GTINs®

(Revision 1.2)

About This Best Practices Guideline

Best practices are generally accepted, informally-standardized techniques, methods or processes that have been proven 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 produce initiative. PTI best practices are recommendations created and agreed to by volunteers from all facets of the produce industry supply chain and by the 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.

Version No.	Date of Change	Changed By	Summary of Change
Original	March 2009	Synchronization Subgroup	Original best practice
1.1	7/29/2009	Synchronization Subgroup	Expanded the section "Format of a GTIN"
1.2	11/04/2011	Master Data Working Group (MDWG) and Implementation Working Group (IWG)	Added +/- 20 percent clause to the dimensional headers in the attribute example tables
1.2	11/04/2011	MDWG and IWG	Added Grade as an attribute in the attribute example tables
1.2	11/04/2011	MDWG and IWG	Updated FAQ section
1.2	11/04/2011	MDWG and IWG	Added use cases for common industry scenarios
1.2	11/04/2011	MDWG and IWG	Added methods for assigning GTINs for multiple levels of packaging

Introduction and Objectives

PTI Milestone 2 calls on Brand Owners to assign Global Trade Item Numbers® (GTINs) to identify their products. Full-chain traceability is achieved when the GTIN and Batch/Lot Number for each case of fresh produce is tracked as the case moves through the supply chain. By thoughtfully preparing to assign GTINs, a Brand Owner can minimize the administrative and operational burden involved. This document outlines tips for preparing to assign GTINs to achieve those efficiencies.

The best practices described in this document are designed to:
- employ a strategy to minimize the number of GTINs assigned, and therefore have to be managed and communicated to trading partners;
- minimize operational delays associated with packing transitions that require a different pack label; and
- standardize product descriptions to reduce confusion and to implement logistics industry standards.

Frequently in a best practice document, sector terms will be used which require definition to align with terminology of the greater standards community. See Table 1 for a guide to such 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.

Sector Term	GS1 Glossary Term	Definition
• Each • Base Unit • Saleable Unit	Trade Item	Any item (product or service) upon which there is a need to retrieve pre-defined information and that may be priced, ordered, or invoiced at any point in any supply chain.
• Case • Traded Unit • Bin • Tote • Pallet • RPC • Tray	Standard Trade Item Grouping	A standard composition of trade item(s) that are not intended for point-of-sale scanning. The PTI has chosen to use the GTIN-14 for case level traceability.
• Pallet • Non-Standard Mixed Case	Logistics Unit	An item of any composition established for transport and/or storage that needs to be managed through the supply chain.

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Sector Term	GS1 Glossary Term	Definition
• Pallet	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.
• PTI voice pick code		The PTI voice pick code is printed on the PTI label, and designed to integrate with voice pick systems popular in large warehouse management systems (WMS). The PTI voice pick code itself is a 4-digit digest of the Global Trade Item Number (GTIN) and Batch/Lot Number (and optionally, Pack/Harvest Date) that is calculated using a well proven, standard algorithm. The voice pick code is included as one of the elements on the PTI case label, when the label is printed.
	Global Trade Item Number (GTIN)	The globally-unique GS1 System identification number for products and services. A GTIN may be 8, 12, 13, or 14 digits in length. The GTIN-14 has been selected for use in the PTI.
	Indicator Digit	The leftmost digit of a GTIN in a GTIN-14. The digit '0' indicates a base unit Global Trade Item Number, digits 1 to 8 are used to define a packaging hierarchy of a product with the same Item Reference, and digit 9 indicates a variable measure trade item.
	GS1 Company Prefix	A globally-unique number assigned to companies by GS1 Member Organizations to create the identification numbers of the GS1 System.
	Check Digit	A digit calculated from the other digits of an element string, used to check that the data has been correctly composed or correctly keypunched.
	Item Reference Number	The part of the GTIN allocated by the user to identify a trade item for a given GS1 Company Prefix.
	Application Identifier (AI)	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 (01)	The AI (01) indicates that the GS1 AI data field contains a GTIN. The AI is fixed in length and encodes 14 numeric digits only.
	AI (10)	The AI (10) indicates that the GS1 AI 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 in length and encodes a maximum of 20 characters per Appendix A.
	AI (13)	The AI (13) indicates that the GS1 AI data fields contain a packaging date. This date is the date when the goods were packed as determined by the packager. The AI is fixed in length and encodes 6 numeric digits only, in an YYMMDD format.

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Sector Term	GS1 Glossary Term	Definition
	AI (15)	The AI (15) indicates that the GS1 AI data fields contain a "best by" date. This date indicates the ideal consumption or best effective use date of a product. The AI is fixed in length and encodes 6 numeric digits only, in an YYMMDD format.
NOTE: Other GS1 AIs available within the GS1 System which can also be utilized within the GS1-128 barcode. For a full list of the GS1 AIs, please see Section 3.0 of the GS1 General Specifications. Rules for concatenating any GS1 AI are covered in Section 4.11 of the GS1 General Specifications, highlighting mandatory associated AIs and invalid pairs of AIs.		

*RPC is the acronym for Reusable Plastic Container

Assigning GTINs to Private Label Products

The Brand Owner of private label products (aka the Private Label Brand Owner, or PLBO) is responsible for assigning GTINs for those products, not the grower or packer serving that PLBO. Note that if a PLBO allows more than one grower or packer to use the same GTIN, there is a remote possibility of repetition of Batch/Lot Numbers across the marketplace. In other words, the same Batch/Lot Number might be used by several growers at the same time, which can result in marketplace confusion if a traceback is required. Care should be taken to correctly track Batch/Lot Numbers for private label products when using multiple growers or packers.

Best Practices for Preparing to Assign GTINs

1. **Standardize product descriptions so that GTINs are assigned only for unique combinations.**

Companies whose item master lists or databases (commonly referred to in the industry as an "item master") use "free form" product descriptions are encouraged to replace those descriptions with standardized product descriptions based on established produce attribute definitions. This will make it easier to maintain an item master list and help with implementing Milestone 3, "Providing GTIN information to customers." For assistance in developing standardized product descriptions, see the PTI's best practice regarding data synchronization and related produce attribute lists, available on the PTI website's Resources & Tools page.

For companies with item masters that are already based on attribute tables, PTI recommends removing any duplicate entries – for example, "12/3#" and "12 - 3lb" are duplicate items and one of the entries should be removed. (Please note that if any of these duplicates have already been assigned GTINs, a determination will need to be made as to which GTIN to retain; decommissioned GTIN(s) should be removed from the system and not reused for other items for at least 48 months.)

In addition, PTI recommends that only items in use during a given season be defined as active; otherwise, define items not currently in use as inactive.

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GTINs then are assigned only for a unique combination of attributes, and new GTINs are assigned only when an item is added that represents a new combination of attributes.

2. Minimize the number of GTINs assigned by defining them at a summary level.

Most fresh produce suppliers utilize very detailed item masters in their internal operations. For example, it is not unusual for the item master of a mid- to large-sized supplier to contain several thousand items. A diverse company's item master list can change significantly as growing seasons change, causing some items to be activated and others to be deactivated over the course of a year.

When assigning GTINs, a Brand Owner's first inclination may be to assign a corresponding GTIN to every product listed in its item master. However, maintaining a similarly detailed list of GTINs can present a major problem for suppliers. For example, each time a field or shed packing operation shifts to packing a different pack configuration, packing must be stopped to change labeling systems to use the appropriate unique GTIN. Brand Owners will benefit by taking care to reduce the number of GTINs they utilize, by assigning GTINs at a summary level.

For example: A peach packer may have 13 detailed items to define various varieties of yellow-flesh, size 52 peaches. If a GTIN were to be created for every one of these criteria, a large number of GTINs would result (as shown In Table 2). This table also shows the attributes which should drive assignment of a new GTIN each time the attribute's value changes; see the column "Change Requires New GTIN".

Alternately, a Brand Owner could group varieties of the same commodity into higher, less specific classifications. This reduces the quantity of GTINs needed. Then GTIN assignment becomes more simplistic, resulting in this simple item list with which to assign new GTINs (as shown in Table 3).

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Table 2: Table showing an example of GTIN assignment at the variety level

Attribute	Commodity (Functional Name)	Variety (Variant)	Country of Origin	Case Qty (Qty of Next Lower Level)	Case Type (Packaging Type)	Pack Style (Packaging Type)	Pack Size (Net Content)	Pack Size Unit (Net Content UoM)	Size Group (Descriptive Size)	Growing Method	Grower Label (Farm)	Grade	Brand Name	Any Dimensional Changes (H, W, D) (+/- 20%)	Any Weight Changes (Gross, Net) (+/- 20%)	Unique GTIN
Change Requires New GTIN	YES	YES	NO	YES	YES	If level has a GTIN, change will effect that GTIN and higher levels	YES	YES	If dimensions change, YES	NO, unless the consumer is to tell the difference	NO	YES	YES	YES	YES	
Examples	Peach	August Lady	USA		Carton	Tray Pack	52	Each		Tree Ripe	CL	US No. 1	Brown's			*00614141000012*
	Peach	Summer Lady	USA		Carton	Tray Pack	52	Each		Tree Ripe	LH	US No. 1	Brown's			*00614141000029*
	Peach	August Lady	USA		Carton	Tray Pack	52	Each		Tree Ripe	MO	US No. 2	Brown's			*00614141000036*
	Peach	Rosario	USA		Carton	Tray Pack	52	Each		Tree Ripe	SH	US No. 1	Brown's			*00614141000043*
	Peach	Crown Prince	USA		Carton	Tray Pack	52	Each		Tree Ripe	MX	US No. 1	Brown's			*00614141000050*
	Peach	Red Top	USA		Carton	Tray Pack	52	Each		Tree Ripe	FG	US No. 1	Brown's			*00614141000067*
	Peach	Rich Lady	USA		Carton	Tray Pack	52	Each		Tree Ripe	MO	US No. 1	Brown's			*00614141000074*
	Peach	Rich Lady	USA		Carton	Tray Pack	52	Each		Tree Ripe	MX	US No. 2	Brown's			*00614141000081*
	Peach	Rich May	USA		Carton	Tray Pack	52	Each		Tree Ripe	LZ	US No. 1	Brown's			*00614141000098*
	Peach	Royal Glory	USA		Carton	Tray Pack	52	Each		Tree Ripe	TY	US No. 1	Brown's			*00614141000104*
	Peach	Royal Glory	USA		Carton	Tray Pack	52	Each		Tree Ripe	IT	US No. 1	Brown's			*00614141000111*
	Peach	Vista	USA		Carton	Tray Pack	52	Each		Tree Ripe	LH	US No. 1	Brown's			*00614141000128*
	Peach	Ryan Sun	USA		Carton	Tray Pack	52	Each		Tree Ripe	MO	US No. 1	Brown's			*00614141000135*

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Table 3: GTIN assignment accomplished using higher level grouping of items

Attribute	Commodity (Functional Name)	Variety (Variant)	Case Qty (Qty of Next Lower Level)	Case Type (Packaging Type)	Pack Style (Packaging Type)	Pack Size (Net Content)	Pack Size Unit (Net Content UoM)	Size Group (Descriptive Size)	Grade	Brand Name	Any Dimensional Changes (H, W, D) (+/- 20%)	Any Weight Changes (Gross, Net) (+/- 20%)	Unique GTIN
Change Requires New GTIN	YES	YES	YES	YES	If level has a GTIN, change will effect that GTIN and higher levels	YES	YES	If dimensions change (+/- 20%), YES	YES	YES	YES	YES	
Examples	Peach	Yellow		Carton	Tray Pack	52	Each		US No. 1	Brown's			00614141000142

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# Appendix A: GTIN Assignment Examples, Methods and FAQs

1. Examples of GTIN Assignment

The following examples of are intended to provide guidance to help Brand Owners and their packers better understand when and how to assign unique GTINs.

a. Brand Owner/Packer A packs a commodity of two different sizes into two different cases (See Figure 1a.). Can the same case-level GTIN be used on both boxes?

No, the same GTIN cannot be used because the items in each case are different sizes, an attribute that warrants a unique GTIN for size option. The receiver of the case, and optionally the consumer, should be informed of the size difference.

Figure 1a: Different commodity sizes and case sizes warrant assignment of different GTINs.
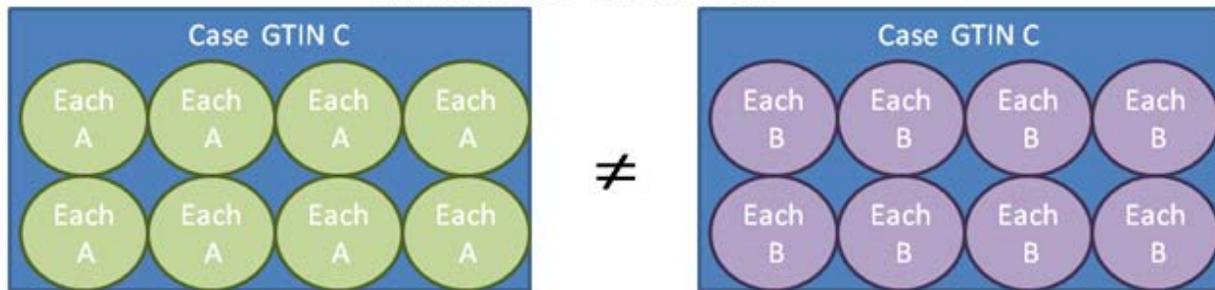
b. Brand Owner/Packer A packs a commodity with two different cases under different brands. (See Figure 1b.) Can the same case-level GTIN be used on both boxes?

No, the same GTIN should not be used because the items contained in the case are different, and the receiver of the case and the end consumer should be informed of the brand difference.

**Figure 1b:** Different brands warrant assigning different GTINs.

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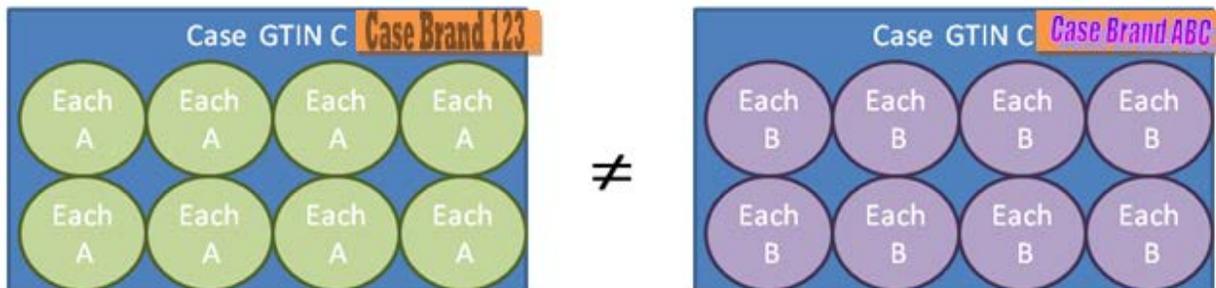
c. Re-Packer C breaks up existing cases of two different products, both of which have assigned GTINs, and repacks their contents into a single case. (See Figure 1c.) Can either of the existing case-level GTINs be used on the new case?

No, this is not allowable as the products contained in the case have different contents from the existing GTINs.

Figure 1c: Packing of mixed cases warrants assignment of a different GTIN.
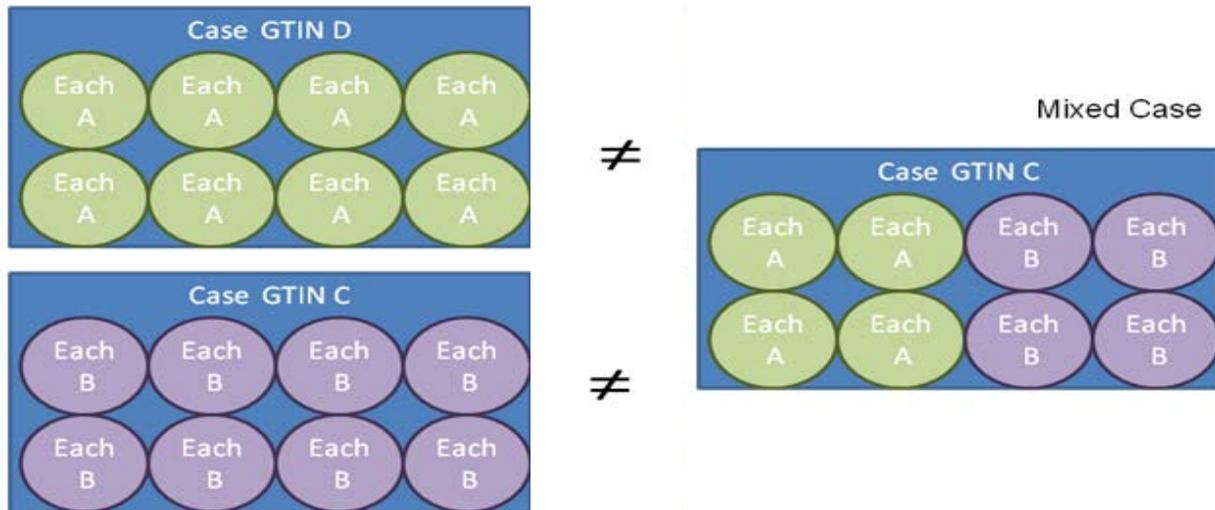
d. Packer D offers an item that always has a total of 8 units of 2 different products (we'll call them products A and B). However, the quantity of products A vs. B might vary from case to case. Can these cases use the same case-level GTIN?

Yes, these cases can use the same GTIN; this is called a dynamic assortment. Dynamic assortments always have a set number of units inside. Those units are always drawn from a set list of products. The dynamic element is that the number of each item may fluctuate from one packing to the next.

Figure 1d: Case always contains 8 units. Contents are always from a set list of items. Actual quantity of each item may vary from one case to the next. The same GTIN is recommended.

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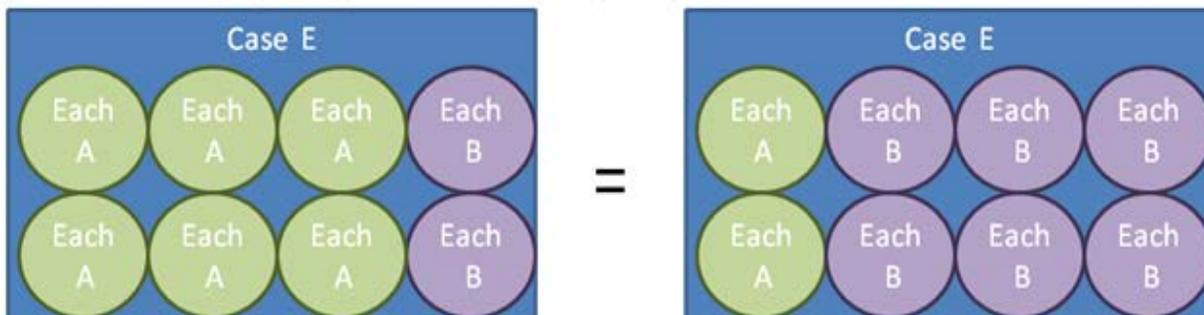
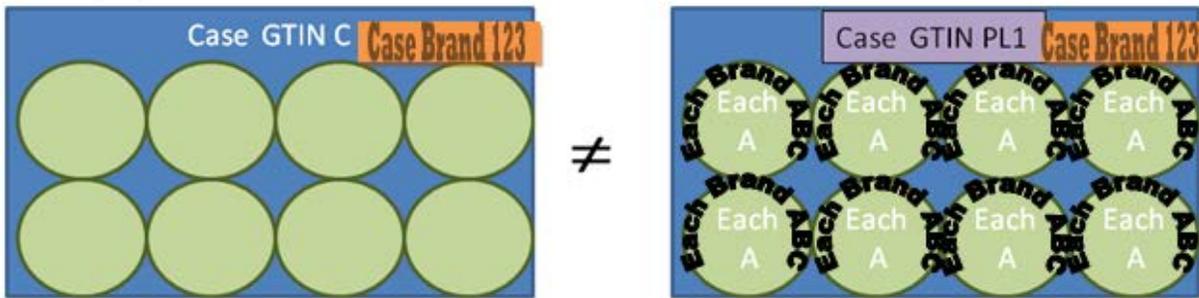e. Bulk product, unwrapped in a grower's branded case, is packaged in private label packaging. The private label packaging is marked with a GTIN from the Private Label Brand Owner (PLBO). Once the packaging is completed the product is placed back into the original grower branded case. The case still displays the grower's brand. A new PTI (case) label is created using the PLBO's Company Prefix, which will not match the brand printed (graphically represented) on the case. Is this acceptable?

Yes, this relabeling of the now-repacked case is acceptable when the following cautions are observed: the re-packer/third-party distributor maintains the one-up/one-down level of traceability when creating the private-label case GTIN *and* traceability is maintained when co-mingled product is packed into one case (e.g., a case of 8 items is created from 4 items from Brand A and 4 from Brand X).
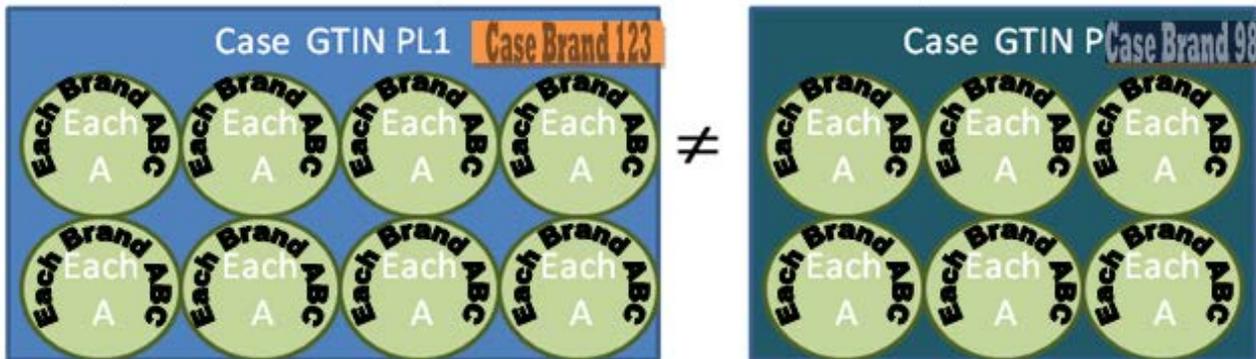
Figure 1e: Bulk product from Case GTIN C bearing that brand owner's GTIN is repacked into private label packaging and put back into the original case. This warrants replacing the case label with one bearing the PLBO's GTIN.

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f. Items which have a PLU or GS1 DataBar sticker (bearing a reference to a specific brand) are repackaged into specialty packaging, or into cases which are marked with different brand markings. The case is labeled with the case-level GTIN of the repacking Brand Owner, even though the branding on the PLU or GS1 DataBar stickers inside the box may not be the repacking Brand Owner's. Is this an acceptable practice?

Yes, this is acceptable if the case-level GTIN bears the Company Prefix of the Brand Owner of the brand that is most recognizable on the case.

Figure 1f: Items repacked into a new case configuration should bear the repacking Brand Owner's GTIN, even though the items inside may bear PLU or GS1 DataBar branding that is different than that of the repacking Brand Owner.

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2. <u>GTIN Assignment Methods</u>

Although the PTI recommends only assigning GTINs at the case level, currently many organizations also use GTINs to identify individual items, inner packs, pallets, etc. Therefore, we have provided below the various different options that are available today for assigning GTINs for multiple levels of packaging. The following three scenarios illustrate how to assign GTINs at various item and package levels; note that uniqueness can be achieved by using different Indicator Digits or different Item Reference Numbers at the higher levels of packaging.

A. Different Item Reference Numbers for higher levels of packaging

It is acceptable to utilize the digit '0' in the Indicator Digit position at all hierarchy levels, while providing a different Item Reference Number at each level to ensure uniqueness (as shown in Figure 2a). 'C' is a placeholder for the automatically-calculated Check Digit and is the 14th digit of the GTIN.

<u>Figure 2a:</u>

0	0614141	99912	C
0	0614141	99929	C
0	0614141	99988	C

Pallet: 1 Pallet of 24 Cases of - 5lb bags Orange 88s
Case: 1 Cases of 4- 5lb bags Orange 88s
Item: 5lb bag Orange 88s

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B. Indicator Digit for higher levels of packaging

It is acceptable to utilize the digits '1' to '8' in the Indicator Digit position at the designated hierarchy levels, while maintaining the same Item Reference Number at each level to ensure uniqueness (as shown in Figure 2b). The digit '9' may be used in the Indicator Digit position, but it is reserved for Variable Measure Trade Items. 'C' is reserved for the automatically-calculated Check Digit and is the 14th digit of the GTIN.

Figure 2b:

5	0614141	99988	C
2	0614141	99988	C
0	0614141	99988	C

C. Combination of Indicator Digit and Item Reference for higher levels of packaging

It is acceptable to utilize the digit '0' in the Indicator Digit position at multiple different unit levels of the hierarchy, while providing a different Item Reference Number at those levels to ensure uniqueness (as shown in Figure 2c). The remaining hierarchy levels utilize the digits of '1' to '8' in the Indicator Digit position at the designated hierarchy levels, while maintaining a same Item Reference Number at each level to ensure uniqueness. 'C' is reserved for the automatically-calculated Check Digit and is the 14th digit of the GTIN.

Figure 2c:

2	0614141	99929	C
0	0614141	99929	C
0	0614141	99988	C
0	0614141	99944	C

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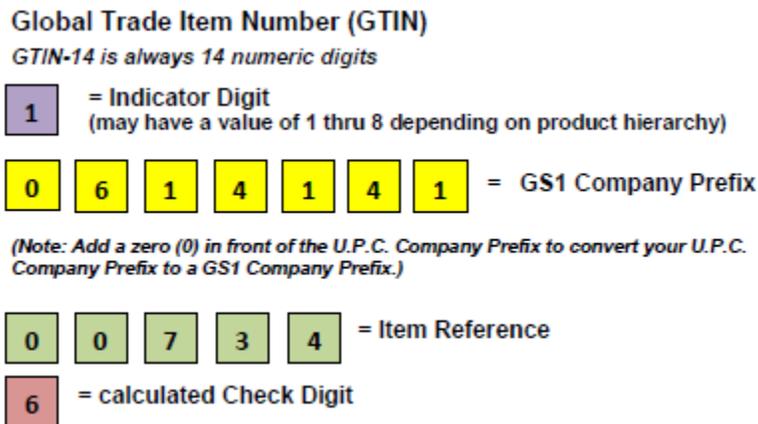Source: www.producetraceability.org

3. Questions and Answers Regarding GS1 Global Trade Item Number (GTIN) and Batch/Lot Number Assignment

Q: First two digits of the GS1 GTIN-14: I have read that the first digit represents a 'Packing Indicator'. I do not know what the second digit represents. How are these two numbers assigned, and where does a shipper get these numbers to assign to their case-level GTINs?

Example: 10614141007346

A: The first digit is the "indicator" digit, and the second digit will be a "0" (it is the first digit in the GS1 Company Prefix if it was obtained by GS1 US). See Figure 3a. (FYI, the next group of digits is the rest of the GS1 Company Prefix assigned to your organization, the next group of digits is the "reference number" (depending on how long your Company Prefix is) and the final digit is the Check Digit.)

Figure 3a:

Global Trade Item Number (GTIN)
GTIN-14 is always 14 numeric digits

1 = Indicator Digit
(may have a value of 1 thru 8 depending on product hierarchy)

0 6 1 4 1 4 1 = GS1 Company Prefix

(Note: Add a zero (0) in front of the U.P.C. Company Prefix to convert your U.P.C. Company Prefix to a GS1 Company Prefix.)

0 0 7 3 4 = Item Reference

6 = calculated Check Digit

Q: The Company Prefix – is this number a standard 6 digits (never more or less)?

Example: 00123456000013

A : No. The Company Prefix can be anywhere from 6 digits to 10 digits. The GS1 Company Prefix should never be parsed out, as the GTIN is only unique when viewed in its entirety.

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Q: Item Reference Number - Is this number always 5 digits? Can this number be described as a Global PLU? Will the PTI assign industry-wide Item Reference Numbers to packers? (Example: Will all potato packers receive a list of the corresponding industry-wide Reference Numbers for each count carton of Russet potatoes?)

Example: 00123456<mark>000001</mark>3

A: No. The Item Reference Number varies, as does the GS1 Company Prefix. A GTIN's first digit is a one-digit indicator, digits 2-13 are a combination of GS1 Company Prefix and Item Reference Number, and the last digit is a one-digit Check Digit; which results in using 11 digits of a 14-digit GTIN to identify for both your GS1 Company Prefix and your Item Reference Number. Therefore, if you have a 7-digit GS1 Company Prefix, you have 5 digits left over for your Item Reference Number. If you have a 8-digit GS1 Company Prefix, you have 4 digits left over for your Item Reference Number, etc.

Q: Check Digit – How is this number assigned? How does a shipper know what check digit to use?

Example: 001234560000<mark>1</mark><mark>3</mark>

A : The Check Digit number is calculated by an algorithm; you can download that algorithm to use in your programs from the GS1 US website. (Members of other GS1 Member Organization should check with their office or on its website; you can view the list of GS1 Member Organizations and their contact information at www.gs1.org.) Alternately, you can use GS1 US's check digit calculator which you can find on the PTI website. Enter the first 13 digits of the GTIN into the calculator, and it will calculate the check digit for you. This calculation ensures the resulting 14-digit GTIN is globally unique.

Q: Are check digits used for any other data elements such as the Application Identifier (10) for lot?

A : No. PTI only uses check digits in the GTIN. For PTI purposes, the check digit is only used as the last digit in the GTIN.

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