



The Global Language of Business

GS1 Fresh Fruit & Vegetable Labelling Consumer Units Guideline

provides support to companies seeking to label fruit & vegetable product information at the consumer unit (each) level using GS1 standards.

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1 Introduction

It is usual business for the global fruit and vegetable sector to provide fresh products every day. Consumers value the high quality and wide range of fruit and vegetables on the shelves of their retail stores; however supply and demand can change easily in the short term based on factors such as: climate, season, weather and plant health issues. This makes it very important for fruit and vegetable retailers to be able to react rapidly to get the right produce in their stores.

Efficient order and delivery processes, flexibility and traceability: the demands of the fruit and vegetables business have constantly increased over the last years. By means of unique product identification, which can be achieved by using the GS1 standards, these demands can be fulfilled by small, medium and large size companies.

1.1 Purpose and Scope of this Guideline

Increasingly there is an expectation within industry to utilise common, global standards for product identification and marking combined with automated electronic data processing. For all sectors, this is the most efficient way to manage ordering, receiving, tracking and tracing and labelling of products easily and without problems.

Experts within the fruit and vegetable sector have created this guideline which includes an overview on the different label forms recommended for fruit and vegetable products and provides business examples explaining the right content and sizes to use.

Every effort was made to make this guideline relevant across all target markets however in some instances regional guidelines have been developed to assist the industry and to ensure regulatory or business compliance within those specific markets.

Readers are urged to understand and apply regulatory and business requirements specific to a target market and encouraged to contact their local GS1 Member Organisation (MO) for assistance in the use of the GS1 standards.

1.1.1 Purpose

The purpose of this document is to provide companies with clear guidance on labelling fresh fruit and vegetables in the produce supply chain to support current and future market requirements.

1.1.2 In Scope

In scope is the labelling of fresh fruit and vegetables at the consumer unit (each). Labelling of trade unit (case) and logistic unit (pallet) levels will be addressed in future versions. These terms are explained in Section 1.4 below and cross-referenced with GS1 terms and fruit and vegetable sector terms in the annex section of this guideline.

1.1.3 Out of Scope

Out of scope are labels with Restricted Circulation Numbers (RCN) that are only unique in a certain closed environment, geographic region or company.¹

1.2 Who can use this Document?

Any party that is requested to apply and process label data for fresh fruit and vegetables in the produce supply chain will benefit from this practical guideline. They should understand business opportunities and requirements needed to implement standardised labels using the GS1 standards for identification and data capture. This document is of special interest for packers as they are responsible for labelling and label contents.

¹ Restricted Circulation Numbers can be used to identify variable measure units for Point-of-Sale (POS) but are subject to national GS1 specifications. For more details contact your local GS1 organisation.

1.3 General Guidance

The composition of a label is dependent upon the application, legal and regulatory requirements for the target market and desired optional information such as marketing information.

The content on the label will include GS1 barcode symbols and human readable interpretation (HRI) text, to permit the implementation of the GS1 standards for supply chain efficiencies. The content on the label will also include other human readable text (Non-HRI text) to permit compliance with target market legal requirements and regulations such as nutritional information but, as noted above, that is out of scope for this document. And the content may include other elements such as artwork and Non-HRI text.

The primary purpose of the GS1 Implementation Guideline “Fresh Fruit and Vegetable Labelling Consumer Units” is to provide detailed guidance on how to implement the GS1 labelling standards for fresh fruit and vegetables. This guideline addresses labelling of consumer units (each) in Section 3.

The GS1 standards for labelling include:

- The barcode symbol for automatic identification and data capture (AIDC)
- Human Readable Interpretation (HRI) is the information below or beside a barcode which is encoded in the barcode and Non-HRI Text is all other text on package, label or item. Below is an example of HRI:



- Quality requirements to assure proper reading of barcode symbols, such as label placement and print quality

Because this implementation guideline cannot address all target market legal and regulatory requirements, it is the responsibility of the party applying the labels to be knowledgeable of the requirements within their target markets.

Within this implementation guideline there are notes identified using the Note icon shown below.

There are also remarks included as an aid to users in identifying where mandatory and/or optional requirements for labelling might apply. These are identified using the Remark icon.

- ✔ **Note:** Users needing additional information or instruction should contact their local GS1 Member Organisation.

1.4 Key Terms

Some relevant terms used in this guideline are explained below in order to facilitate a better understanding of the guideline. A more extensive glossary can be found in the annex.

Term	Explanation
GS1 Application Identifier	The field of two or more digits at the beginning of an Element String that uniquely defines its format and meaning.
Consumer Unit (Each)	This term is used in this guideline for the labelling of individual consumer level fresh fruit and vegetables items at retail where the customer selects their produce and takes the produce to the point of sale. This could be a loose produce item or packaged item. The following terms could also be used to identify produce and packaged produce at retail level: Each, Loose, Item, Trade Item, Unit, Consumer Unit, Bulk, Pre-packaged, and Pre-portioned.
Each	An individual fruit or vegetable (e.g. an apple, a pineapple or a pepper).
Fixed Measure Trade Item	A consumer unit (Each) always sold in the same pre-defined measure such as size, weight, contents (e.g. a punnet with 6 round tomatoes).

Term	Explanation
Global Trade Item Number (GTIN)	The GS1 Identification Key used to uniquely identify trade items. The GTIN includes a company prefix and the item identification which is encoded into the barcode for automatic identification and data capture when scanned.
Human Readable Interpretation (HRI)	Human readable text located below a barcode symbol representing the characters encoded in the barcode.
Non-HRI Text	Human readable text on a label used for purposes other than representing the characters encoded in the barcode. (Examples: marketing information, nutritional information, country of origin, etc.).
IFPS PLU Rules	International Federation of Produce standards' rules on the use of the PLU.
Logistic Unit (Pallet)	This term is used in this guideline for the labelling of fresh fruit and vegetables for transportation and storage in the produce supply chain.
Loose	Fresh fruit and vegetables which are delivered to the store loose, in boxes or cases, and then put into a bag or selected individually by the customer for purchase.
PLU (Price Look Up)	An IFPS PLU number on the label in human readable text used to identify the consumer unit.
Restricted Circulation Number (RCN)	Signifies a GS1 identification number used for special applications in restricted environments, defined by the local GS1 Member Organisation (e.g. restricted within a country, company, industry). They are allocated by GS1 for either internal use by companies or to GS1 Member Organisations for assignment based on business needs in their country (e.g. variable measure product identification).
Trade Item	Any item (product or service) upon which there is a need to retrieve pre-defined information and that may be priced, or ordered, or invoiced at any point in any supply chain.
Trade Unit (Case)	This term is used in this guideline for case labelling of fresh fruit and vegetables. "Case" is a generic term which includes any item handled as a single unit in the transport and distribution process. This definition covers a wide variety of package types such as pallets, PRCs, cartons, cases, bins and totes. These items can be trade items and/or logistic units.
Variable Measure Trade Item	A Consumer Unit (Each) which may be traded without pre-defined measure, such as size or weight.

1.5 Legal and Regulatory Requirements

This guideline does not cater to all legal aspects in different countries and regions. Examples where legal and regulatory requirements might apply to the labelling of fresh fruit and vegetables are identified using the Remarks icon; however, the examples shown are not all inclusive.

Users should refer to GS1 country or regional guidelines for their local requirements. Where country or regional guidelines are not available users needing additional information or instruction regarding local or national legal and regulatory requirements should contact their local GS1 Member Organisation.

2 Relevant GS1 Standards and Principles

GS1 standards and GS1 keys support the produce supply chain processes. The relevant standards for the identification of consumer items, trade units and logistic units are summarised below.



Note: If a company wants to implement GS1 standards the company has to be a member of a national GS1 Member Organisation (MO). For a complete list of all GS1 Member Organisations please see the GS1 web site at www.gs1.org then contact your local office.

2.1 GS1 standards for Item Identification (GTIN)

The Global Trade Item Number (GTIN) is the GS1 standard for the unique identification of all trade items (consumer units and trade units), including fresh fruit and vegetables. The GTIN supports trade item identification for Business to Business (B2B) and Business to Consumer (B2C) processes. The GTIN is a GS1 key with a specific structure and allocation rules to assure global uniqueness. The GS1 General Specification prescribes the specifications for the GTIN. The table below gives an overview of the GTINs that are used for labelling fruit and vegetables. All parties in the process should be able to process these variants of the GTIN.

GTIN	GTIN format
GTIN-8	N7 + C
GTIN-12	N11 + C
GTIN-13	N12 + C
GTIN-14	N13 + C

- * N - numeric digit
- C - Check Digit



When any of these GTINs are encoded in a data carrier (i.e. barcode symbol) that encode a fixed-length data string of 14-digits, GTINs with less than 14-digits in length will add leading zeroes to create a 14-digit number. The leading zeroes simply act as filler characters. The presence or lack of these leading zeroes does not change the GTIN concerned. These series of GTINs may be stored with or without leading zeroes in the same database field, depending on the requirements of the particular application.

2.2 GS1 barcodes

This section provides guidance for the selection and use of GS1 barcode symbols.

2.2.1 Point-Of- Sale

At the Point-Of-Sale (POS) the following barcode symbols are relevant:






GS1 barcode	GS1 key	Comments
EAN-8 symbol 	GTIN-8	<ul style="list-style-type: none"> ■ Used for point-of-sale identification of pre-packaged, fixed weight/count trade items
UPC-A symbol 	GTIN-12	<ul style="list-style-type: none"> ■ Used for point-of-sale identification of pre-packaged, fixed weight/count, trade item

GS1 barcode	GS1 key	Comments
<p>EAN-13 symbol</p>	GTIN-13	<ul style="list-style-type: none"> Used for point-of-sale identification of pre-packaged, fixed weight/count, trade item
<p>GS1 DataBar Stacked Omnidirectional symbol</p> <p>Usually HRI is required but due to space restrictions this label typically uses only the IFPS PLU.</p>	<p>Encodes a 14-digit data string with GTIN-8, GTIN-12, or GTIN-13</p>	<ul style="list-style-type: none"> Used for point-of-sale identification of loose trade items Data structure holds up to 14 digits The example shown is the most common related to the identification of loose fruit & vegetables such as apples, bananas, peppers, etc. Data encoded in a GS1 DataBar symbol is used in combination with GS1 application identifiers, to allow for their interpretation.
<p>GS1 DataBar Expanded symbol (stacked omnidirectional)</p> <p>The GTIN number is 90999999543217 Net Weight is 000456 = 0,456 kg Best Before Date is 120521 (YYMMDD)</p>	<p>Encodes a 14-digit data string with GTIN-8, GTIN-12, or GTIN-13</p>	<ul style="list-style-type: none"> The variations GS1 DataBar Expanded and GS1 DataBar Expanded Stacked can encode additional information such as net weight and Best Before Date GS1 DataBar has been approved for bilateral use between trading partners. As of January 2014, GS1 DataBar became an open symbology and all scanning environments must be able to read these symbols. <p> Remark: AI 13Packaging Date or AI 15 Best Before Date may be used depending on target market requirements</p>

2.2.2 General Distribution (trade items that are not intended for Point-of-Sale)

In general distribution, the business process for ordering, invoicing and transporting produce up to but not crossing the point of sale, the following barcode symbols are relevant:

GS1 barcode	GS1 key	Comments
<p>UPC-A symbol</p>	Encodes a GTIN-12	<ul style="list-style-type: none"> Used for general distribution identification of pre-packaged, fixed weight/count, trade item

GS1 barcode	GS1 key	Comments
EAN-13 symbol  9 312345 678907	Encodes a GTIN-13	<ul style="list-style-type: none"> Used for general distribution identification of pre-packaged, fixed weight/count, trade item
GS1-128 symbol (fixed measure)  (01) 3 0614141 000013 (17) 050101 (10) A1B2C3 The GTIN number is 30614141000013 The batch number is A1B2C3 The expiry date is 050101 (YY/MM/DD)	Encodes a 14-digit data string with GTIN + batch number and expiry date	<ul style="list-style-type: none"> Used for trade item identification (fixed weight/count) throughout the supply chain but NOT at point-of-sale. Data encoded in GS1-128 is used in combination with GS1 application identifiers, which determine the data, its format and its structure.
GS1-128 symbol (variable measure)  (01)94054321123459(15)121231(3102)000685 The GTIN number is 94054321123459 The best before date is 121231 (YY/MM/DD) The net weight is 000685 = 6,85 kg	Encodes a GTIN-14 starting with '9'; + best before date and net weight in kilograms	<ul style="list-style-type: none"> Used for trade item identification with variable weight throughout the supply chain but NOT at point-of-sale. Data encoded in GS1-128 is used in combination with GS1 application identifiers, which determine the data, its format and its structure. <p> Remark: AI 13 Packaging Date or may be used in place of AI 15 Best Before Date may be used depending on target market requirements</p>
 (00)340123451234567895 The SSCC is 340123451234567895	GS1-128 symbol Encodes SSCC (18-digit data string)	<ul style="list-style-type: none"> Used for the identification of logistic units Data encoded in GS1-128 is used in combination with GS1 application identifiers, which determine the data, its format and its structure.

 **Remark:**

Please note:

- Systems always need to cater for 14-digit GTINs.
- In practice, data content and data carrier are often not clearly differentiated from each other. This may lead to misunderstandings. It is particularly important to bear in mind that data content (e.g. the identification number plus attributes like weight) can be encoded in different data carriers according to the application.

- When GTINs are encoded in a data carrier that must encode a fixed-length data string of 14-digits, the GTINs less than 14-digits in length must be prefixed by leading zeroes that simply act as filler characters. The presence or lack of these leading zeroes does not change the GTIN concerned. These series of GTINs may be stored with or without leading zeroes in the same database field, depending on the particular application.

2.3 GS1 Application Identifiers

A GS1 Application Identifier (AI) is a numeric code of two or more characters that uniquely defines the format and meaning of the following information. The AI number preceding a piece of information supports its correct interpretation and processing. By means of AIs several pieces of information can be encoded in one barcode and correctly interpreted and processed.

The chart below describes the GS1 Application Identifiers used in this implementation guideline. For a complete list of GS1 Application Identifiers and their full specification refer to the [GS1 General Specifications](#) - section 3.

AI	Data Content	Format (*)	FNC1 Required (***)	Data Title
00	Serial Shipping Container Code (SSCC)	N2+N18		SSCC
01	Global Trade Item Number (GTIN)	N2+N14		GTIN
02	GTIN of Contained Trade Items	N2+N14		CONTENT
10	Batch or Lot Number	N2+X..20	(FNC1)	BATCH/LOT
11 (**)	Production Date (YYMMDD)	N2+N6		PROD DATE
12 (**)	Due Date (YYMMDD)	N2+N6		DUE DATE
13 (**)	Packaging Date (YYMMDD)	N2+N6		PACK DATE
15 (**)	Best Before Date (YYMMDD)	N2+N6		BEST BEFORE or BEST BY
16 (**)	Sell By Date (YYMMDD)	N2+N6		SELL BY
17 (**)	Expiration Date (YYMMDD)	N2+N6		USE BY OR EXPIRY
310 (***)	Net weight, kilograms (Variable Measure Trade Item)	N4+N6		NET WEIGHT (kg)
NOTES:				
(*) : The first position indicates the length (number of digits) of the GS1 Application Identifier. The following value refers to the format of the data content. The following convention is applied:				
N	numeric digit			
X	any character in Figure 7.11-1			
N3	3 numeric digits, fixed length			
N..3	up to 3 numeric digits			
X..3	up to 3 characters in Figure 7.11-1			
(**) : If only year and month are available, DD must be filled with two zeroes.				

[Source: [GS1 General Specifications](#)]



Label Example

AI (01) announces a "Global Trade Item Number". The format is clearly defined, i.e. numeric, 14 digits. As soon as the scanner reads AI (01) in a GS1 symbol (here from a GS1 DataBar Stacked Omnidirectional) it knows that a GTIN with 14 digits, purely numeric, follows.

Figure 2-1 Example


AI GTIN (01) 0401234567000014 Brackets are not encoded in the barcode, only visible in HRI

If a party does not need to process all data elements encoded in a barcode they can select the data elements by means of the application identifiers.

- 
Note: Please note that there are certain rules to be observed. They can be taken from the [GS1 General Specifications](#).
- 
Note: For a complete list of AIs refer to the [GS1 General Specification](#), Section 3.0.

2.4 Label Placement Principles

Consistency of symbol placement is critical to successful scanning. With manual scanning (e.g. at POS), variation of symbol placement makes it difficult for the scanning operator to predict where the symbol is located, and this reduces efficiency.

With automated scanning (e.g. in warehouses on a conveyor belt), the symbol must be positioned so that it will pass through the field of vision of a fixed scanner as it travels past. Respecting the guidance in this section will result in the consistency and predictability required.

Avoiding Scanning Obstacles

Anything that will obscure or damage a barcode will reduce scanning performance and must be avoided.

More placement guidelines will be shown in Section 3.0.

2.5 Barcode Quality

Barcode quality is of critical importance because only readable barcodes support efficient processes. If a barcode cannot be decoded additional cost and time resources are consumed. Therefore all parties should see to it that their barcodes meet with GS1 General Specification requirements.

Verification is the technical process by which a barcode is measured to determine its conformance with the specification for that symbol. ISO/IEC 15416 is the international specification of the ISO barcode verification methodology for linear symbologies (e.g. EAN/UPC symbol, GS1-128 symbol), and the numeric grading system.

GS1's advice is to use the ISO/IEC 15416 methodology as a tool to improve overall scanning performance. An ISO-based verifier is of enormous assistance in diagnosing the problem and providing a standard means of reporting among printing companies and their trading partners.

Many GS1 Member Organisations offer related services, so if quality problems arise or before implementing a new label please contact your local MO to make sure the label meets quality requirements.




3 Consumer Unit (Each)

Consumer Unit (Each) refers to trade item labelling for Point-of-Sale (POS) and includes several ways of presenting fruit and vegetables at POS. The labelling may vary with the presentation at POS.

According to existing standards and requirements at POS as well as regulatory requirements and possible additional scenarios, trade items are labelled but the identification key, design and content of the labels may vary.

Most loose fruit & vegetable trade items have a label / sticker on it with a price look up number (PLU). This PLU is key entered manually or a label / sticker with an EAN/UPC which encodes a GTIN can be scanned automatically. Both identification numbers support the billing process at the POS.

The way consumer units are packaged and presented at POS varies. Examples of different forms of consumer units are:


<p>Pre-packed: A labelled product package that is intended for the consumer. For retail this item will be scanned at the point of sale.</p>	
<p>Loose (by weight or by piece): Fruit and vegetables which are presented to the consumer in a display such as boxes or cases, to be picked by the consumer and weighed or counted at the POS. Depending on the size and nature of the item they may carry a label.</p>	
<p>Pre-portioned: An <u>unlabelled</u> product package that protects the fruit article (e.g. strawberry, blackberry, etc.) and is sold as presented as a whole. Labelling of a pre-portioned consumer unit generally does not require a label by legal or regulatory requirements, but may be labelled (e.g. with a GTIN) by the supplier/packer for POS.</p>	

According to legal requirements a closed pre-packed consumer product will always have a label. It should carry a GTIN encoded in a barcode to make it possible to scan at the point of sale.

Unpacked/loose fruit and vegetables are offered to the consumer from a crate or carton. According to legal requirements there is no obligation to put a label on single units. The consumer picks them in the wanted quantity. They are sold by each or by weight. The decision to label is at the discretion of the retailer, in some cases based on legal aspects. The supplier may assign a separate identification number (GTIN or PLU) to a loose product and label it (e.g. a melon). In most cases, they are not labelled and the retailer himself arranges the sale to the consumer; e.g. a PLU is assigned by the retailer or the consumer sticks a retailer internal label on the article after it has been weighed. Items without labels are out of scope.

 **Remark:**

- Some target markets may require trade items to be labelled with Country of Origin Labelling (COOL).

-  **Remark:** Trade items with a protection package and no label are handled as retailer internal process and in terms of labelling there is a difference between pre-packed and loose articles on the European target market.

- According to regulation EU 1169/2011 a pre-packed consumer product always has a label with clearly defined information. It should carry a GTIN identification number encoded in a barcode to make it possible to scan this article at the point of sale.
- Loose fruit and vegetables and pre portioned consumer units with protection only are covered by regulation EU 1169/2011 and there is no legal obligation to label. An example would be a pumpkin; the consumer picks them in the wanted quantity. They are sold by each or by weight. The decision to label is at the discretion of the retailer.
- Pre portioned consumer units with no label are handled as retailer internal process and is out-of-scope. According to law there is no obligation to put a label on these trade items. The supplier may assign a separate identification number (GTIN or PLU) and label it.
- Different variants of consumer units that may occur at the POS, two perspectives may be relevant in this context:

The following diagrams provide guidance on determining the packaging levels and labelling. If additional guidance is required for a specific application, please contact your local Member Organisation.

Figure 3-1 Commercial Perspective: relevant for handling processes

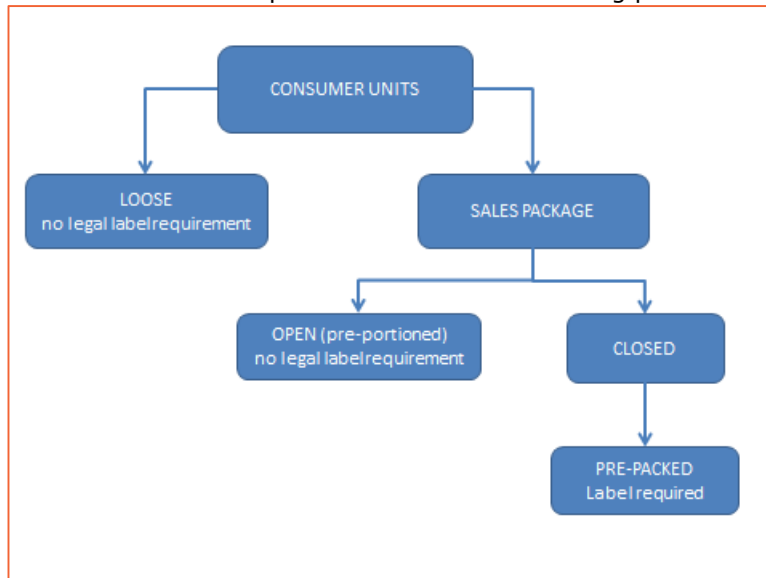
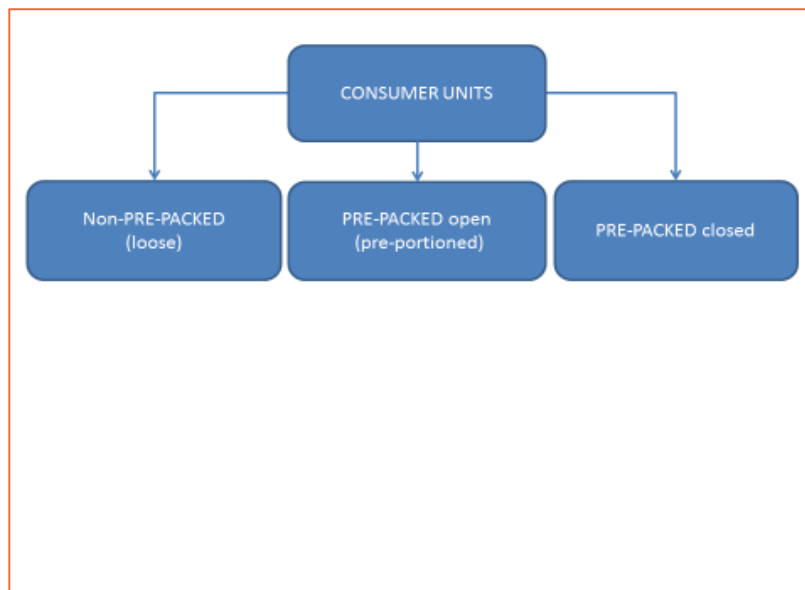



Figure 3-2 Legal Perspective: relevant for marking and labelling processes



-  **Note:** Legal requirements may exist in specific markets (i.e. Canada has regulations around which commodities can be OPEN and how they are labelled)

3.1 General Label Considerations for Consumer Items

Trade items are read at the POS. It is a general requirement to do this fast and efficiently to support smooth processes. The trade item needs a unique identification number. This can be a PLU number or a barcode with a GTIN or, where applicable, both. The GTIN is always encoded in an EAN/UPC or GS1 DataBar Stacked Omnidirectional barcode to allow for automatic scanning. Accurate data and barcode quality should be observed.


3.1.1 Using PLU Numbers

Price Look Up numbers (PLUs) are not used on any bagged product that is always sold as fixed weight (i.e. not weighed in the store for pricing).

- Example: It is not allowed to use both a GTIN in barcode and PLU code(s) together on a 1-pound bag of carrots. That bag of carrots is never sold in variable weight form: the cashier would never weigh it on the scale and determine its price based on a price per pound/kilogram. It is always sold just as is: a 1 pound bag of carrots and should carry the appropriate barcode.

PLUs may be used with a corresponding GTIN in a barcode if the product can be sold either "by each/per unit" or weighed for pricing.
- Background: Countries using the PLU consider it the human readable equivalent of the GS1 DataBar Stacked Omnidirectional as the tiny sticker does not allow for the GTIN to be printed in HRI...

Some retailers have indicated their preference for a barcode whenever possible on variable weight produce. This may vary from retailer to retailer and should be considered when preparing coding for product.


-  **Note:** For full information, please consult the latest version of IFPS Produce PLU "A Users' Guide" (see section 6. Resources).

3.1.2 Using Barcodes

Choosing a GS1 barcode:

- If only a GTIN is to be encoded use an EAN/UPC Symbol.
- In case of smaller items use a GS1 DataBar Stacked Omnidirectional.

If a GTIN and additional data such as net weight are to be encoded use GS1 DataBar Expanded or GS1 DataBar Expanded Stacked.

-  **Note:** This guideline only uses weight in examples below because this information is crucial in some scenarios.

3.1.3 GS1 DataBar Symbols

Figure 3-3 GS1 DataBar symbols used at POS



Required Human Readable Interpretation (HRI) is not shown in the above examples.

3.1.4 Characteristics of the GS1 DataBar

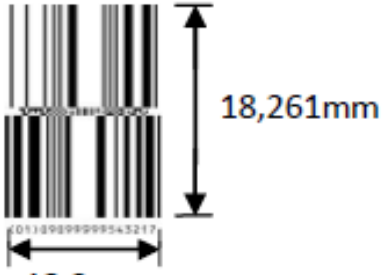
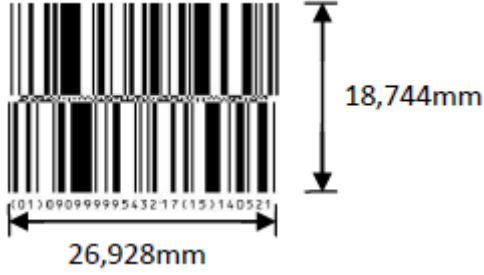

The GS1 DataBar has the following characteristics”

- Fully compatible with currently installed scanner technology
- Linear symbology
- Omnidirectional scanning capability, except in conjunction with “stacked” or “limited” formats
- Space-saving symbology, therefore suitable for extremely small products
- Additional information can be encoded in GS1 DataBar Expanded using the Application Identifier System
- Availability of a range of application-specific symbols provides optimal versatility
- Worldwide symbology protection (ISO/IEC 24724)

✔ **Note:** GS1 DataBar symbols encode a 14-digit numeric string. When encoding GTIN-12 or GTIN-13 in GS1 DataBar symbols, zero-fill with two or one zeros to the left of the GTIN.

✔ **Note:** For more information on GS1 DataBar please see Annex

GS1 DataBar Symbols

GS1 DataBar Stacked Omnidirectional	GS1 DataBar Expanded Stacked
 <ul style="list-style-type: none"> ■ AI (01) GTIN 	 <ul style="list-style-type: none"> ■ AI (01) GTIN ■ AI (15) Best Before Date (YYMMDD)
<p>GS1 DataBar Expanded</p>	
<p>38.35 width, 8.38 mm height</p>  <p>(01)04012345123456(3103)00340</p> <p>AI (01) GTIN AI (3103) net weight</p>	
<p>Note: Indicated symbol dimensions are based on an X-dimension of 0,264 mm</p>	

The size of GS1 DataBar symbols depends on the number of stacked lines, the size of the X-dimension, and how much data is encoded. The minimum X-dimension is 0.264, maximum is 0.66.

Structure of the label

While used on a private label (retailer brand) the requirements are provided by the retailer, while for regular brands and non-branded items the structure and placement of the label should be in the hands of the supplier/packer to avoid customer-specific requirements or to meet regulatory requirements for placement.

Label Size

The size of the label depends on the amount of data and the size of the consumer unit. It is important to observe the technical specifications. Barcodes must be readable. Minimum legal information must be readable!

Common label sizes for consumer units are:

- 40 mm x 47 mm
- 40 mm x 55 mm
- 60 mm x 60 mm
- 68 mm x 45 mm

Human Readable interpretation/Human Readable text

- Below each barcode a human readable interpretation (HRI) must show the content this is often only a GTIN.
- Further human readable text (Non-HRI) may be added on the label according to business process and legal requirements. This may include country of origin, variety, nutritional information, IFPS PLU, etc.

HRI shall appear except in rare circumstances for specific applications where there are extreme space constraints. If the GS1 AIDC data carrier cannot be read or scanned and the HRI does not appear on the label, package or item, Non-HRI text should be used as backup information.

3.2 Specific Label Scenarios for Consumer Units

As consumer units may occur in different forms (fixed weight vs variable weight, pre-packed, loose, etc.) the layout and content of the labels vary accordingly. The paragraphs below provide label details of the most relevant label solutions for:

1. pre-packed consumer unit(fixed weight)
2. pre-packed consumer unit (variable weight)
3. unpacked/loose piece (sold at retailer 's discretion by each or by weight)

3.2.1 Label on Pre-packed Consumer Unit (Fixed Weight)

Figure 3-4 Example



The left column shows 2 options depending on the size of the consumer unit and the business requirements.

Identification / GS1 Data Carrier	Information on the label
GTIN in EAN/UPC Symbol GTIN in GS1 DataBar Symbol (especially for packages of small or round items. Example: mini peppers).	Human Readable interpretation below each barcode (HRI)* Remark: Regulatory requirements may apply to labels used on item (e.g. country of origin). Please refer to your local regulatory requirements.

Note: If additional attributes such as lot number or expiry date, GS1 DataBar Expanded or Expanded Stacked symbol can be used

3.2.2 Label on Pre-packed Consumer Unit (Variable Weight)

Figure 3-5 Example




Identification / GS1 Data Carrier	Information on the label
<p>GTIN + weight in GS1 DataBar Expanded or Expanded Stacked</p>	<p>Human Readable interpretation below each barcode (HRI)</p> <p>✔ Remark</p> <p>Regulatory requirements may apply to labels used on item (e.g. country of origin). Please refer to your local regulatory requirements</p> <p>✔ Note</p> <p>In some target markets RCNs are still being used while being phased out. Please refer to your local MO for additional instructions.</p>

3.2.3 Label on Non Pre-packed / Loose Piece

Labelling a non-pre-packed/loose piece is not a general requirement, but is done based on business / customer requirements.

Figure 3-6 Examples



Identification / GS1 Data Carrier	Information on the label
GTIN in EAN or UPC Symbol GTIN in GS1 DataBar (typically Stacked Omnidirectional) GTIN plus net weight in GS1 DataBar Expanded  Note: At the retailer`s discretion loose fresh food items can be processed as fixed or variable measure products.	Human Readable interpretation below each barcode (HRI) IFPS PLU-number can be added

 **Notes:**

- If only an internal PLU is on the label it can only be used on the premises of this one retailer.
- If loose produce has been defined to be sold by the each, the trade item can be identified like a fixed measure item, i.e. with a GTIN only.
- The retailer decides how to handle variable measure fresh food trade items sold at POS.

Extract From “GS1 AIDC Fresh Foods Sold at Point-of-Sale Implementation Guide” (2011)

The Figure 1 below is an extract from the GS1 AIDC Fresh Foods Sold at Point-of-Sale Implementation Guide and provides additional guidance for loose items.

Figure 3-7 Extract from GS1 AIDC Fresh Foods Sold at Point-of-Sale Implementation Guide

4.7.3. Loose Produce Trade Items

Loose Produce trade items are trade items which are identified with a GTIN. At the retailer’s discretion, loose produce can be sold as fixed or variable measure products.

If this product is to be identified as variable measure, see variable measure Section 4.6.

- When a loose produce item is further processed in-store and repackaged, it may be sold by the retailer as a fixed measure trade item, then it is treated as a Fixed Measure Trade Item and follows - Loose Produce Trade Items Scanned at Point-of-Sale of the GS1 General Specifications Section 2.
- However, if loose produce is sold as a variable measure trade item, then it is treated as Variable Measure Trade Item and follows - Variable Measure Fresh Food Trade Items Scanned at Point-of-Sale Using GTIN of the GS1 General Specifications Section 2.

For loose produce you can use GS1 DataBar Stacked Omnidirectional to encode GTIN only.

Additional Label Examples

Figure 3-8 GTIN in GS1 DataBar Stacked Omnidirectional with HRI



Figure 3-9 GTIN in GS1 DataBar Stacked Omnidirectional with IFPS PLU and without HRI



- ✔ **Note:** HRI shall appear except in rare circumstances for specific applications where there are extreme space constraints. If the GS1 AIDC data carrier cannot be read or scanned and the HRI does not appear on the label, package, or item, Non-HRI text should be used as backup information.

Figure 3-10 GTIN in EAN-13 symbol with HRI below the symbol



- ✔ **Note:** Label size compels the use of a heavily truncated under-sized symbol. Best practice would be to use GS1 DataBar in this situation.

3.2.4 Pre-portioned Consumer Unit

Although it is stated in the introduction of this chapter that pre-portioned consumer units do not have a label they may occur labelled. In this case the recommendation under 3.2.3 may be applied.

3.2.5 How to Manage Non-POS Product That May Go to POS

A brand owner is the responsible party for identification of their trade items using GS1 standards. They should identify and segment inventories with different GTINs according to GTIN Allocation Rules and commercial agreements. This does not mean that a trade item intended by the brand owner for use at POS or not at POS will never be used by a downstream trading partner in a manner not intended. This exception cannot be managed by GS1 standards compliance, but only by bilateral commercial agreements.

3.3 Label Design (How to design a label)

The supplier/packer decides how the label is structured and designed by taking into account marketing aspects, legal requirements and GS1 specifications and implementation guidelines. In case of private labels, the retailer provides the relevant requirements. The GS1 General Specification provides specifications for barcode size and quality.

3.4 Label Placement (Where to put the label)

When placing labels on fruit and vegetables, the following principles, practices and examples should be considered to assure the labels will properly and efficiently scan. The GS1 General Specification provides specifications for label placement.

Principles:

- At least one barcode is needed on a trade item intended for the Point-of-Sale.
- Only one barcode should be on a label.
- More than label on an item should be avoided
- If more than one label is placed every label should contain the same GTIN
- Anything that will obscure or damage a barcode will reduce scanning performance.
- If the barcode height is below the recommended height it is not omnidirectional readable and has an impact on reading performance

Practices:

- Never position the barcode on the item in an area with inadequate space. Do not let the other graphics encroach on the space for the barcode.
- Never place barcodes, including Quiet Zones, on perforations, die-cuts, seams, ridges, edges, tight curves, folds, flaps, overlaps, and rough textures.
- Never put staples through a barcode or its Quiet Zones.
- Never fold a symbol around a corner.
- Never place a symbol under a package flap.
- Barcodes used for production control purposes should be obstructed wherever possible before entering general distribution

Examples

Figure 3-11 Example



Scanning issue due to bad contrast (barcode is located on side panel)

Figure 3-12 Example



Scanning issue due to bad placement

Figure 3-13 Example



Scanning issue due to lack of height

4 Resources

GS1 General Specifications

<http://www.gs1.org/barcodes-epcrfid-id-keys/gs1-general-specifications>

Information about structure and use of the GTIN:

www.gs1.org/barcodes/technical/idkeys/gtin

GS1 in Europe

www.gs1.eu

GTIN Allocation Rules for Fresh Foods

www.gs1.org/1/gtinrules/index.php/tid=32

GS1 Global Office

www.gs1.org

UNECE Standards for Fresh Fruits and Vegetables (FFV)

www.unece.org/trade/agr/standard/fresh/FFV-StandardsE.html

UNECE Standards for Dry and Dried Produce (DDP)

www.unece.org/trade/agr/standard/dry/DDP-Standards.html

Codex Alimentarius – International Food Standards



www.codexalimentarius.org

EU Regulation on Fruit & Vegetables EU 543/2011

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:157:0001:0163:EN:PDF>

IFPS Produce PLU "A Users' Guide"

www.ifpsglobal.com and/or www.plucodes.com

A Annex

A.1 Cross Reference of Terms

Produce Sector Term	Guideline Term	GS1 Glossary Term	GS1 Definition
Each Base Unit Saleable Unit	Consumer Unit (Each) Unit Item Loose Pre packed Pre proportioned	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	Trade Unit (Case)	Trade Item Grouping	A standard composition of trade item(s) that are not intended for point-of-sale scanning.
Pallet Non-Standard Mixed Case	Logistic Unit (Pallet)	Logistic Unit	An item of any composition established for transport and/or storage that needs to be managed through the supply chain

A.2 Glossary – GS1 Terms & Definitions

Term	Definition
Automatic Identification and Data Capture	A technology used to automatically capture data. AIDC technologies include barcodes, smart cards, biometrics and RFID.
barcode	A symbol that encodes data into a machine readable pattern of adjacent, varying width, parallel, rectangular dark bars and pale spaces.
Barcode Verification	The assessment of the printed quality of a barcode based on ISO/IEC standards using ISO/IEC compliant barcode verifiers.
Batch / Lot	The batch or lot number associates an item with information the manufacturer considers relevant for traceability of the trade item. The data may refer to the trade item itself or to items contained in it.
brand owner	The party that is responsible for allocating GS1 System Identification Keys. The administrator of a GS1 Company Prefix.
Check Digit	A final digit calculated from the other digits of some GS1 Identification Keys. This digit is used to check that the data has been correctly composed. (See GS1 Check Digit Calculation.)
Customer	The party that receives, buys, or consumes an item or service.
data character	A letter, digit, or other symbol represented in the data field(s) of an Element String.
data field	A field that contains a GS1 Identification Key, an RCN, or attribute information
data titles	Data titles are the abbreviated descriptions of Element Strings which are used to support manual interpretation of barcodes.
EAN/UPC Symbology	A family of barcodes including EAN-8, EAN-13, UPC-A, and UPC-E barcodes. Although UPC-E barcodes do not have a separate symbology identifier, they act like a separate symbology through the scanning application software. See also EAN-8 barcode, EAN-13 barcode, UPC-A barcode, and UPC-E barcode.



Term	Definition
EAN-13 barcode	A barcode of the EAN/UPC Symbology that encodes GTIN-13, Coupon-13, RCN-13, and VMN-13.
Element	A single bar or space of a barcode.
Extension digit	The first digit within the SSCC (Serial Shipping Container Code) which is allocated by the user and is designed to increase the capacity of the SSCC.
Fixed Measure Trade Item	An item always produced in the same pre-defined version (e.g., type, size, weight, contents, and design) that may be sold at any point in the supply chain.
Fresh Foods	Trade items in the following product categories: fruits, vegetables, meats, seafood, bakery and ready to serve food such as cheeses, cold cooked or cured meats, and salad, etc. Fresh Foods is defined as food that is not preserved by canning, dehydration, freezing or smoking.
General Distribution Scanning	Scanning environments that include barcoded trade items packaged for transport, logistic units, assets, and location tags.
Global Trade Item Number (GTIN)	The GS1 Identification Key used to identify trade items. The key comprises a GS1 Company Prefix, an Item Reference and Check Digit.
GS1 AIDC data carrier	A means to represent data in a machine readable form; used to enable automatic reading of the Element Strings as specified for use by GS1.
GS1 Application Identifier	The field of two or more digits at the beginning of an Element String that uniquely defines its format and meaning.
GS1 Company Prefix	Part of the GS1 System identification number consisting of a GS1 Prefix and a Company Number. The Company Number is allocated by GS1 Member Organisations. See also U.P.C. Company Prefix. GS1 Member Organisations assign GS1 Company Prefixes to entities that administer the allocation of GS1 System identification numbers. These entities may be, for example, commercial companies, not for profit organisations, governmental agencies, and business units within organisations. Criteria to qualify for the assignment of a GS1 Company Prefix are set by the GS1 Member Organisations.
GS1 DataBar Expanded barcode	A barcode that encodes any GS1 Identification Key plus Attribute data, such as weight and "best before" date, in a linear symbol that can be scanned omnidirectionally by suitably programmed Point-of-Sale scanners.
GS1 DataBar Expanded Stacked barcode	A barcode that is a variation of the GS1 DataBar Expanded barcode that is stacked in multiple rows and is used when the normal symbol would be too wide for the application.
GS1 DataBar Omnidirectional barcode	A barcode that encodes a GTIN. It is designed to be read by omnidirectional scanners.
GS1 DataBar	A family of barcodes, including GS1 DataBar Omnidirectional; GS1 DataBar Stacked Omnidirectional; GS1 DataBar Expanded; GS1 DataBar Expanded Stacked GS1 DataBar Truncated, GS1 DataBar Limited, and GS1 DataBar Stacked symbols.
GS1 DataBar Retail POS Family	The members of the GS1 DataBar Symbology family designed to be read in segments by omnidirectional scanners at retail POS: GS1 DataBar Omnidirectional; GS1 DataBar Stacked Omnidirectional; GS1 DataBar Expanded; GS1 DataBar Expanded Stacked.
GS1 DataBar Stacked barcode	A barcode that is a variation of the GS1 DataBar Truncated barcode that is stacked in two rows and is used when the GS1 DataBar Truncated barcode would be too wide for the application.
GS1 Global Data Dictionary	A repository tool used to record GS1 member standards agreements on business terms and definitions used by all business units.
GS1	Based in Brussels, Belgium, and Princeton, USA, it is the organisation that manages the GS1 System. Its members are GS1 Member Organisations.
GS1 Identification Key	A numeric or alphanumeric data field defined by GS1 to ensure the global, unambiguous uniqueness of the identifier in the open demand or supply chain.



Term	Definition
GS1 Identification Keys	A globally managed system of numbering used by all GS1 Business Units to identify trade items, logistic units, locations, legal entities, assets, service relationships, consignment, shipments and more. Any identification number that combines GS1 member company identifiers (GS1 Company Prefix) with standards based rules for allocating reference numbers is a key.
GS1 Member Organisation	A member of GS1 that is responsible for administering the GS1 System in its country (or assigned area). This task includes, but is not restricted to, ensuring brand owners make correct use of the GS1 System, have access to education, training, promotion and implementation support and have access to play an active role in GSMP.
GS1 Prefix	A number with two or more digits, administered by GS1 that is allocated to GS1 Member Organisations or for Restricted Circulation Numbers.
GS1 System	The specifications, standards, and guidelines administered by GS1.
GTIN Application Format	A format for a GTIN-8, GTIN-12, or GTIN-13 used when a GTIN application uses a fixed field length, for example, when a GTIN-13 is encoded in symbology using Application Identifier (01).
GTIN-12	The 12-digit GS1 Identification Key composed of a U.P.C. Company Prefix, Item Reference, and Check Digit used to identify trade items.
GTIN-13	The 13-digit GS1 Identification Key composed of a GS1 Company Prefix, Item Reference, and Check Digit used to identify trade items.
GTIN-14	The 14-digit GS1 Identification Key composed of an Indicator digit (1-9), GS1 Company Prefix, Item Reference, and Check Digit used to identify trade items.
GTIN-8	The 8-digit GS1 Identification Key composed of a GS1-8 Prefix, Item Reference, and Check Digit used to identify trade items.
Human Readable Interpretation (HRI)	Characters, such as letters and numbers, which can be read by persons and are encoded in GS1 AIDC data carriers confined to a GS1 standard structure and format. The Human Readable Interpretation is a one-to-one illustration of the encoded data. However Start, Stop, shift and function characters, as well as the Symbol Check Character, are not shown in the human readable interpretation.
Leading Zero(s)	Digits (always zeroes) which must be placed in the leftmost position(s) of a data string when GTIN-8, GTIN-12, or GTIN-13 are encoded in an GS1 AIDC data carrier that requires 14-digits (see also GTIN Application Format) or when used for the same intent in other data structures such as GRAI.
Logistic unit	An item of any composition established for transport and/or storage that needs to be managed through the supply chain. It is identified with an SSCC.
Loose Produce	Fruits and vegetables which are delivered to the store loose, in boxes or cases, and then put into a bag or selected individually by the customer for purchase.
Non-HRI Text	Characters such as letters and numbers that can be read by persons and may or may not be encoded in GS1 AIDC data carriers and are not confined to a structure and format based on GS1 standards (e.g., a date code expressed in a national format that could be used to encode a date field in a GS1 AIDC data carrier, brand owner name, consumer declarations).
Point-of-Sale (POS)	Refers to the retail checkout where omnidirectional barcodes must be used to enable very rapid scanning or low volume checkout where linear or 2D matrix barcodes are used with image-based scanners.
Price check digit	A digit calculated from the price element of a Variable Measure Number encoded using the EAN/UPC Symbology. Used to check that the data has been correctly composed.
Restricted Circulation Number (RCN)	Signifies a GS1 identification number used for special applications in restricted environments, defined by the local GS1 Member Organisation (e.g., restricted within a country, company, industry). They are allocated by GS1 for either internal use by companies or to GS1 Member Organisations for assignment based on business needs in their country (e.g., variable measure product identification, couponing).

Term	Definition
Serial Shipping Container Code	The GS1 Identification Key used to identify logistics units. The key comprises an Extension digit, GS1 Company Prefix, Serial Reference, and Check Digit.
Shipment	A grouping of logistics and transport units assembled and identified by the seller (sender) of the goods travelling under one despatch advice and/or Bill of Lading to one customer (recipient).
Trade item grouping	A predefined composition of trade item(s) that is not intended for Point-of-Sale scanning. It is identified with a GTIN-14, GTIN-13, or GTIN-12.
Symbol	The combination of symbol characters and features required by a particular symbology, including Quiet Zone, Start and Stop Characters, data characters, and other auxiliary patterns, which together form a complete scannable entity; an instance of a symbology and a data structure.
symbol character	A group of bars and spaces in a symbol that is decoded as a single unit. It may represent an individual digit, letter, punctuation mark, control indicator, or multiple data characters.
Symbology	A defined method of representing numeric or alphabetic characters in a barcode; a type of barcode.
symbology element	A character or characters in a barcode used to define the integrity and processing of the symbol itself (e.g., start and stop patterns). These elements are symbology overhead and are not part of the data conveyed by the barcode.
symbology identifier	A sequence of characters generated by the decoder (and prefixed to the decoded data transmitted by the decoder) that identifies the symbology from which the data has been decoded.
Trade item	Any item (product or service) upon which there is a need to retrieve pre-defined information and that may be priced, or ordered, or invoiced at any point in any supply chain.
Variable Measure Trade Item	A trade item which may be traded without a pre-defined measure, such as its weight or length.

[Source: [GS1 General Specifications](#)]

A.3 GS1 DataBar

The GS1 DataBar family consists of 7 different variants, only 4 of them are applicable for POS.

Choose the right GS1 DataBar symbol and size:

- Check the space dedicated to the barcode on the label and the data to be encoded. This will enable you to select the right GS1 DataBar type.
 - GTIN only: GS1 DataBar Omnidirectional. If less space GS1 DataBar Stacked Omnidirectional.
 - GTIN plus weight: GS1 DataBar Expanded. If less space GS1 DataBar Expanded Stacked
- Choose the X-dimension. This should be between 0.264 mm and 0.660 mm, for loose produce it may be 0,203 mm and then lead to slower scanning performance. For more details refer to the [GS1 General Specification](#) Chapter 5, Symbol Specification Table 1.

Data transmitted by the scanner

The GS1 DataBar family symbols are designed and intended to be used with symbology identifiers and also specified in the ISO standard. GS1 DataBar family symbols are normally transmitted using symbology identifier prefix "je0". For example, a GS1 DataBar Symbol encoding AI (01) Element String produces the transmitted data string "je00104012345000016."

GS1 DataBar Expanded Symbols encode the application identifiers. All Element Strings of variable length and those of fixed length not stated in the predefined table shown in Gen Specs page 357 must be delimited when followed by another Element String in a single barcode. The delimiter is a Function 1 Symbol Character (FNC1). This is transmitted as a <GS> (ASCII 29) unless it is the last character in a symbol in which case it is not transmitted.

How to use GS1 DataBar

For more information please reference: <http://www.gs1.org/barcodes/databar>



For a readiness checklist for suppliers and retailers please refer to the GS1 AIDC Fresh Foods Sold at POS Implementation Guide:

http://www.gs1.org/docs/gsmf/fresh_foods/Fresh_Food_Implementation_Guide.pdf

For symbol specifications for GS1 DataBar Symbols for POS reference GS1 General Specifications, Section 5, Symbol Specification Table 1, The GS1 General Specifications is the core standards document of the GS1 System describing how GS1 barcodes and identification:

<http://www.gs1.org/genspecs>