The Australasian Hardware Industry

Industry Guidelines for the Numbering and Bar Coding of Trade Items

Version 1.0

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Document History/Summary of Changes

Version	Date	Revision Comments
1.0	October 2001	First version circulated
1.1	November 2001	Revision of Implementation timetable, alterations to EAN•UCC Logistics Label formats, minor wording changes throughout document
1.2	February 2002	Addition of timber specific examples. First version released to Hardware Industry.
1.3	August 2002	Reformatted document to become more generic to enable addition of more specific industry Sector group sections.
1.4	December 2002	Deletion of specific technical references to logistic label format, addition of acknowledgement of specific references to Sector groups of Timber Industry Timber, Greenlife and Plumbing, deletion of when to change GTIN table replacing with reference to website program
2.0	December 2002	Released to Hardware Industry
3.0	September 2005	Chapter added to cater for Electrical Sector Group and body of document reviewed to reference the Electrical Sector Group and its members where applicable. GS1 Australia contact details updated at start of document. Updated services offered by GS1 Australia, Section 14.3.
3.0	September 2005	Changed terminology: EAN Australia to GS1 Australia
3.0	September 2005	Included the content under 2 The GS1 System and its components.
1.0	October 2007	Australasian version 1.0 completed. Content updated to include changed GS1 terminology.
1.0	December 2007	Final changes to Australasian version made and industry input incorporated.

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These guidelines should be read in conjunction with the ***user manuals issued by GS1 Australia and GS1 New Zealand respectively, hereafter referred to as 'the technical literature'.***

Disclaimer

Every possible effort has been made to ensure that the information and specifications in this document are correct, however GS1 Australia, GS1 New Zealand BizEvolution, The Hardware Industry Working Group (HIWG) and members of all associated sector groups, expressly disclaim liability for any errors. In addition, no warranty or representation is made that this document will not require modification due to developments in technology or changes or additions to the GS1 System.

Acknowledgements

This Numbering and Bar Coding Guideline for the Australasian Hardware Industry was originally developed by GS1 Australia as part of the Hardware Industry B2B E-Commerce Project facilitated in 2001/2002 by Tradegate ECA. In April 2007 GS1 Australia kindly authorised GS1 New Zealand to modify the document for use in New Zealand and it was redeveloped as an Australasian Hardware Industry Guide.

Each version of this document has been modified with the input of the existing members of the Hardware Industry Working Group (HIWG). Current members are listed on the HIWG web site, www.hiwg.org.au.

How to Use this Guideline

This guideline has been written to assist companies with the implementation of the GS1 System throughout their business.

The document is divided into two parts:

Part 1: (Sections 1 to 8):

This part provides a generic description of how to number and bar code trade items, attribute information and logistic units throughout the supply chain using the GS1 Standards throughout the entire Hardware Industry. Examples provided do not reflect all the different types of trade items available in this industry but the principles are the same regardless of the product type.

Part 2: (Sections 9 to 13):

This part describes specific examples highlighted by Hardware Industry sectors not the method of how to apply numbers and bar code symbols. This part should be read in conjunction with part 1.

The specific technical recommendations pertaining to the printing, size and location of the bar code symbols are not included within these guidelines. Companies should refer to the ***technical literature provided by their GS1 organisations or consult GS1 for this information.***

Contents

1 Introduction and Overview

The GS1 System originated in the United States. These standards were established in 1973 by the Uniform Product Code Council or Uniform Code Council, Inc® (UCC™), now known as GS1 US. GS1 US adopted a 12-digit identification number known as the U.P.C System. The first identification numbers and bar code symbols in open trade were being scanned in 1974.

Following the success of this U.P.C. System, the European Article Numbering Association or EAN International, now known as GS1, was established in 1977 to develop a compatible system for use outside North America. The then named EAN System was designed as a superset of the UCC standards and principally used 13-digit numbers for product identification. As a consequence of using certain bar code symbols and data structures, the System has expanded. The EAN•UCC System, now known as the GS1 System, matured further to incorporate standards for Radio Frequency Identification (RFID) and data synchronisation. Refer to section 2 for further information.

The historical development of the GS1 System has seen it grow from a purely retail perspective to encompassing all components and aspects of supply chain management. As a result of this historical process, areas of the system require choices about the nature of the trade item, the expected scanning path through the supply chain, etc. This should not be seen as a limitation or a hindrance towards the use of the system more a realisation of the development and support of the system internationally.

The versatility of the GS1 System provides users with various numbering and bar coding options. It is left to the discretion of manufacturers and suppliers to decide which option is suitable to their business needs and those of their trading partners.

1.1 Who are GS1 Australia and GS1 New Zealand?

GS1 Australia and GS1 New Zealand are not for profit member organisations that locally administer the global multi-industry system of identification and communication for products, services, assets and locations - the GS1 System.

Created to help Australasian business enterprises to become more efficient, the fundamental role of GS1 Australia and GS1 New Zealand is to issue GS1 Company Prefixes and GS1 Identifiers to companies, to help them maintain internationally accepted trading standards. This in turn allows organisations in both countries to adopt worlds' best practice supply chain management techniques.

GS1 and its partner organisation, the GS1 US, collaboratively developed the GS1 System. The system is recognised by the International Standards Organisation (ISO), the European Standardisation Committee (CEN) and The American National Standards Institute (ANSI). Today, over one million member companies in 128 countries use the GS1 System as part of their daily business communications, representing over five billion scanning transactions a day.

1.2 Who is the Hardware GS1 Action Group?

Pooling the knowledge and experiences of the Australian and New Zealand Hardware industry participants, and following the lead of other global hardware initiatives, the Hardware GS1 Action Group has been set up to help develop, promote and deliver user guidelines, training courses and implementation programmes relating to the global GS1 standards.

The Hardware GS1 Action Group is overseen by a representative leadership group made up of key retailers and suppliers across Australia and New Zealand.

To address the needs of the Hardware industry, following work groups have been set up:

- *Numbering & bar coding* – to oversee issues related to retail, non-retail and logistical unit identification and tracking;
- *Data Synchronisation* – to lead the trialling and implementation of data synchronisation via GS1net; and

- *eMessaging* – to continue the maintenance of GS1 EANCOM guidelines, and oversee industry adoption of GS1 XML messaging.

Future workgroups are expected to oversee industry adoption of RFID, Global Location Numbering and development of industry specific case studies.

1.3 Who is the HIWG?

The Hardware Industry Working Group (HIWG) is a community of organisations committed to the development and implementation of industry agreed B2B (business-to-business) eCommerce guidelines and recommendations. It is a self-managed and self-funded consortium and includes members from a range of organisations across Australia and New Zealand including retailers, distributors, wholesalers and suppliers from the broad hardware industry - including the electrical, greenlife, plumbing, timber and home building sectors.

Members of the HIWG collaborate to develop industry agreed B2B eCommerce guidelines and recommendations, based on global standards wherever possible, in order to maximise value from e-trading. The work of the HIWG is focused on the application of eCommerce to enable supply chain improvements, including the opportunity to streamline business processes. In addition, pilot to production implementation projects are co-ordinated and general industry education and awareness is delivered.

Members of the HIWG recognise that this work is never complete and that they are on a path of learning and understanding, positioning their organisations, and the hardware industry as a whole, for the future. All outcomes of the work done by the HIWG are made available to others in the industry from the HIWG website at http://www.hiwg.org.au

2 The GS1 System

The GS1 System allows continuous improvement in e-commerce supply chain management practices by providing international standards for item identification, data capture, electronic messaging and data synchronisation. These standards are also being enhanced and expanded to reflect business needs and advances in technology.

Through the automation of business processes, the GS1 System drives increasingly fast, efficient and accurate flow of information between trading partners, factors that are fundamental to the success of any business.

Increasingly, corporate success is based, not on having the best product, but on having the best supply chain management practices. An efficient supply chain allows companies to build better relationships with trading partners today, and ensures products and services achieve greater competitiveness and demand tomorrow.

2.1 Components of the GS1 System

The components that make up the GS1 System include: E-Messaging, GDSN (Global Data Synchronisation Network), EPCglobal™ and Bar Codes & Numbering.

Identification & Bar Codes: Within the GS1 System, numbering and data carriers (bar code symbols) are used to make possible the identification of all trade items, processes, services, shipments, assets, companies and locations to facilitate communication, data collection and exchange of information and smooth the flow of information between trading partners. GS1 Australia and GS1 New Zealand strive to assist and support their members and industry to implement the GS1 System to obtain maximum benefits.

E-Messaging: EANCOM and GS1 XML Standards for e-Messaging are based on the principle of the transfer of structured data, by agreed messaging standards from one computer application to another by electronic means and with a minimum of human intervention. The structure and data content are exchanged by agreed means by trading partners. The electronic exchange of data or e-messaging provides trading partners with an efficient trading tool for the transmission of data.

GDSN: The Global Data Synchronisation Network (GDSN) is a concept developed by various industry groups, including Global Commerce Initiative (GCI) and GS1 to assist industries streamline their supply chain transactions, in the aim of reducing supply chain costs. The GDSN is an internet based interconnected network of interoperable data posted to a global registry that enables companies around the globe to exchange standardised and synchronised supply chain master data with their trading partners.

EPCglobal™: The EPC (Electronic Product Code) is the open, global standard combines low-cost RFID technology, existing communications network infrastructure and the Electronic Product Code (a number for uniquely identifying an item) to create cost-efficient, real-time, accurate information about the location of items, the history of items, and the number of items in the supply chain. It is based on research conducted through the Auto-ID Centre with the support of more that 100 leading companies.

The EPC Network is comprised of a number of fundamental elements:

- Electronic Product Code (EPC)
- EPC Tags and Readers
- Object Name Service (ONS)
- EPC Information Services (EPCIS)
- Middleware (Application Level Event Software)

An overview of the GS1 System is provided in **Diagram 1**: **The GS1 System**.

Diagram 1: The GS1 System

Please Note: From this point onwards, this guide will focus only on the GS1 standards for numbering and bar coding.

3 Executive Summary

As the Hardware Industry in Australasia seeks to adopt the key principles of Efficient Consumer Response (ECR) there is increased demand for improved data capture at all points of the supply chain. This should be a key objective for all trading partners if they are to effectively meet their company needs and exceed customers' expectations.

The efficient servicing of customers is the process of supplying the right products, right quantity, right price, right quality, right time and place with a minimum of effort. The benefits are the avoidance of wasted effort, measured in terms of low cost and high levels of customer service.

Achieving efficiency in the management of the supply chain relies on having fast, accurate and timely information about production, distribution and consumption. The need for a highly responsive supply chain is driving forward the development of communication techniques. Bar codes and Electronic Data Interchange (EDI) are the technologies for this communication. Any company serious about exploiting the concepts and practices of supply chain management must be bar code and EDI competent. Nothing is more central to the effectiveness of a supply chain than the ability to transmit accurate, relevant, understandable and timely information among its participants.

These recommendations for best practice encompass the main requirements of the Australasian Hardware Industry, including the Timber, Greenlife, Plumbing and Electrical sectors. Adoption of these recommendations should bring improved business efficiency and effectiveness for all companies within the supply chain.

4 Benefits of Implementation

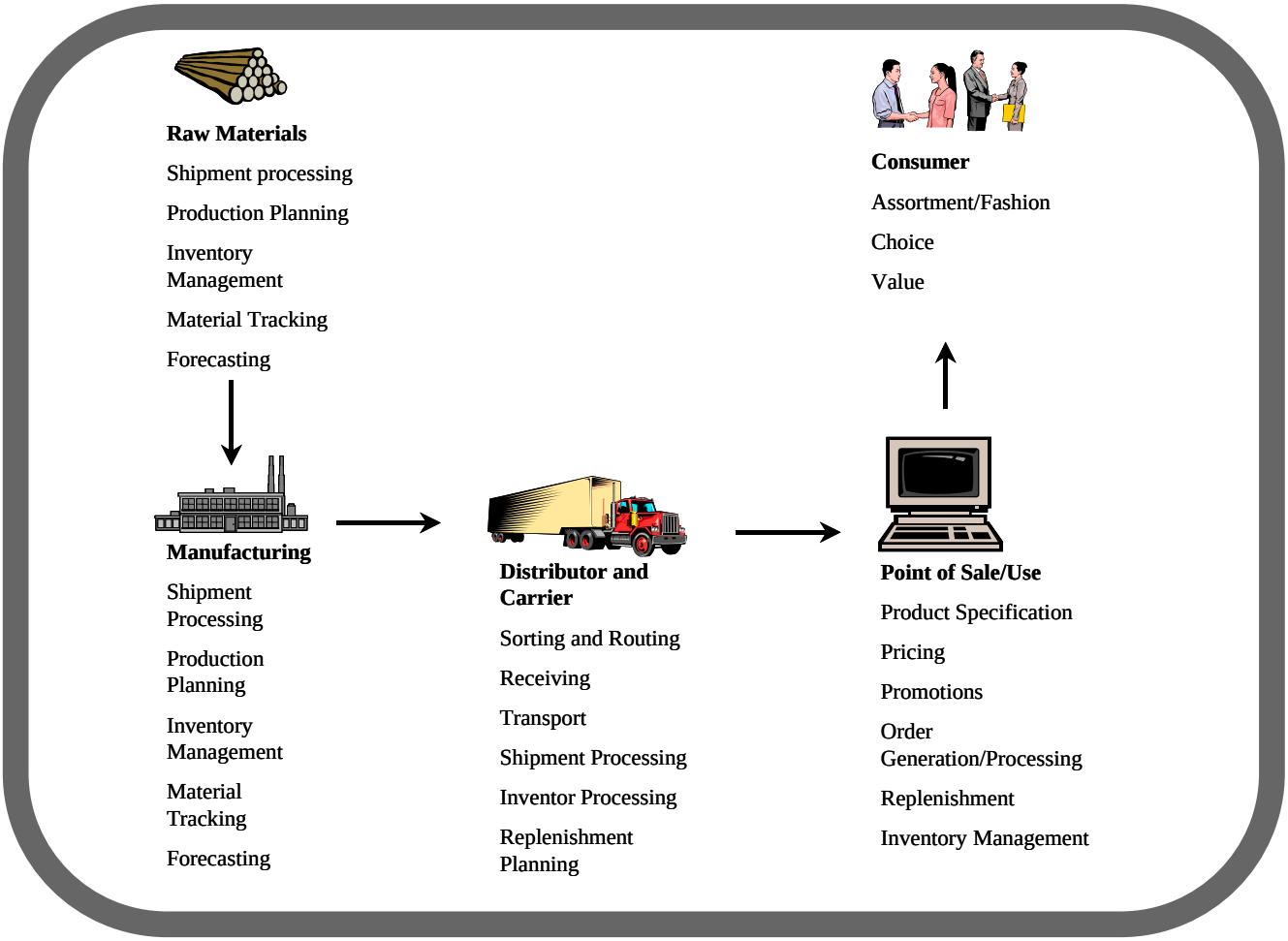
Using a standard approach to the numbering and bar coding of trade items and logistic units will help the industry move towards delivering benefits of speed, accuracy and labour savings in the handling and distribution of goods throughout the entire supply chain. Companies should consider that the implementation of the GS1 System is applicable not only to meet customer or trading partner demands but also to improve internal supply chain management. The benefits listed below are defined generically for users throughout the entire supply chain and not just the end user.

Some of the specific identified benefits are:

- More accurate information
- Real-time information
- Reduced manual entry
- Improved traceability (including for product recalls/withdrawals)
- Common identification across Industry
- Improved stock handling
- Improved stocktaking
- Reduced picking errors
- Reduce customer order

The numbering and bar coding of trade items supports the following supply chain functions:

Diagram 2: Numbering and Bar Coding Benefits along the Supply Chain



5 Australasian Hardware Industry Requirements

This is a practical guideline for companies who are intending to implement the numbering and bar coding of trade items. The recommended times listed below for implementation are provided as a guide for all parties throughout the supply chain and it is recognised that some companies may require more or less time according to their current level of implementation and trading partner agreements.

Table 1: Implementation Timetable

Time Frame	GTIN required for POS items[3]	GTIN required for trade items not sold at POS	Attribute data identified at Industry Level	SSCC[4]	Global Location Number[5]
Refer to trading partner requirements and whole of industry call to action documents.	Required on Individual trade items				
		Required on trade items not sold at the Point-of-Sale where appropriate			
				Will be required by most retailers for scan receipting	
			Additional information may be required based on trading partner relationships		
					Will be required once messaging standards implemented

[3] See Section 7.1 for further information about Point-of-Sale items.
[4] When combined with EDI the SSCC improves efficiency throughout the supply chain. In the event where EDI has not yet been fully implemented solutions exist to enable the use of the SSCC during any transitional period. Refer to Section 8 for relevant solutions
[5] See Appendix 15.2.2 for further information

6 Principles of the GS1 System for Numbering and Bar Coding

6.1 Introduction

The GS1 standards for numbering and bar coding cover different areas of application. These include trade items, logistic units, assets and locations. These applications rely on standard numbering structures by which all relevant items and their data can be identified. The numbers are the key to accessing databases and identify items unambiguously handled. At the same time these numbers are used in all messages of a transaction.

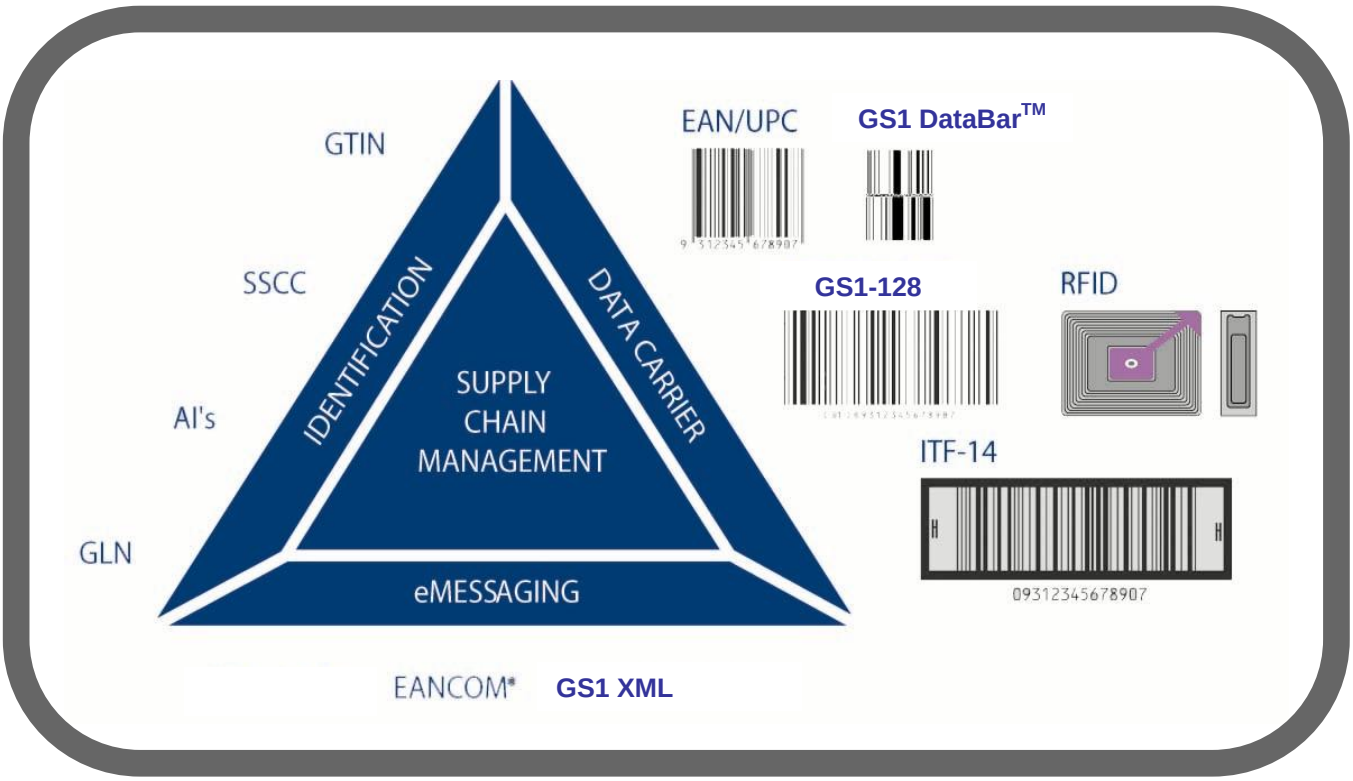
Numbering is for identification only and any information found in databases. The information is communicated from the user-to-user once, generally before the first transaction either by using standard messages or by consultation of electronic catalogues.

The numbers are represented in bar code symbols to allow automatic data capture at each point where an item leaves or enters premises. Bar codes are usually included in the production process, at the producer/supplier site or they may be pre-printed with other information present on the packaging. The method of application of the bar code symbol depends on the information required, the type of product produced and other printing factors.

The same numbers are also used in Electronic Data Interchange (EDI) messages to allow all information relevant to the transaction to be identified. The standard numbering structures that are provided guarantee worldwide uniqueness within the relevant area of application.

In addition to the numbering structures, the GS1 standards allow for the marking of additional information known as attribute data. Examples of such data includes, serial numbers, weights for variable measure trade items, batch numbers etc.

Diagram 3: Components of the GS1 standards



Note: For information about RFID and GS1 DataBar please refer to section 15.3.

6.2 The Data Structures – Numbering

The GS1 standards provide data structures for different applications. The application will determine how the number is to be used, but regardless of application, each number must be used in its entirety and not broken into constituent parts. The data structure guarantees worldwide uniqueness within the relevant area of application.

6.2.1 Global Trade Item Number (GTIN)

A trade item is 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. This definition covers raw materials through to the end user products and also includes service, all of them having pre-defined characteristics.

A trade item may be a single, non-breakable unit. It may also be a standard and stable grouping of a series of single items. Such a unit may be presented in a wide variety of physical forms: a fibreboard carton, a covered or banded pallet, a film wrapped tray, a crate with bottles, etc. Trade items consisting of single units are identified with a unique Global Trade Item Number (GTIN); standard groupings of identical or different units are identified with separate unique GTINs.

Note: Global Trade Item Numbers (GTINs) were formally known as GS1 numbers or bar code numbers, EAN numbers, APN numbers or APNs. This document will refer to the numbers only as GTINs to ensure correct current international terminology is adhered to.

The identification and bar coding of trade items enables the automation of the retail Point-of-Sale, of product receiving, inventory management, automatic re-orderings, sales analysis and a wide range of other business application.

The GTIN can be represented in one of four ways:

- GTIN-14
- GTIN-13
- GTIN-12
- GTIN-8

The above mentioned data structures provide unique identification when they are right justified and stored in a 14 digit data field as shown in Table 2 below.

Table 2: EAN•UCC Data Structures

Numbering Structure for a GTIN	GTIN within a 14 digit computer field													
	T_1	T_2	T_3	T_4	T_5	T_6	T_7	T_8	T_9	T_{10}	T_{11}	T_{12}	T_{13}	T_{14}
GTIN-14	1	9	3	1	2	3	4	5	6	7	8	9	0	4
GTIN-13	0	9	3	1	2	3	4	5	6	7	8	9	0	7
GTIN-12	0	0	6	1	2	3	4	5	1	2	3	4	5	2
GTIN-8	0	0	0	0	0	0	9	3	1	2	3	4	5	7

Note: T represents the position of each individual digit in a computer file format and zero (0) represents a filler digit. This format is used in business transactions, especially for Electronic Data Interchange (e.g. orders, invoices, price catalogues).

6.2.2 Attributes of Trade Items

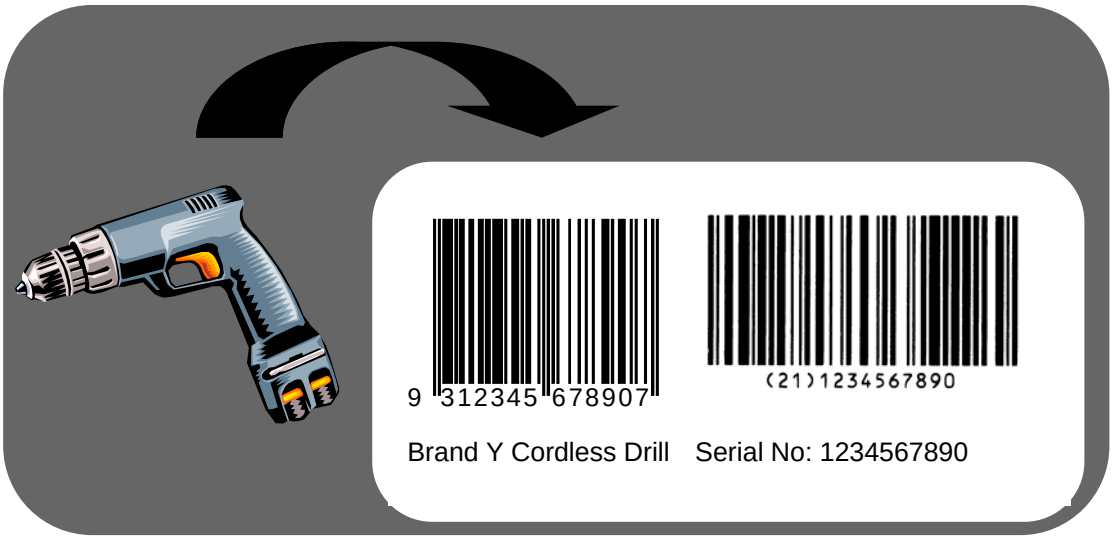
Attribute information of trade items is any data over and above the item identity allocated to the GTIN. Examples of this type of information include batch numbers, serial numbers, variable measure information such as length, weight etc.

Attribute information is always represented with Application Identifiers (AIs) represented in a GS1-128 or GS1 DataBar Bar Code Symbol. The use of Application Identifiers ensures that the attribute information can be used between trading partners throughout the entire supply chain.

Suppliers, at their discretion, can apply to trade items any of the AIs available to them under the GS1 specifications (Refer to GS1 Australia's website, www.gs1au.org in the download section for a complete list of list of AIs available). The use of attribute information can facilitate traceability within the supply chain and hence improve quality control, production of consistent product, stock rotation etc.

Example:

Diagram 4: Attribute Information used for traceability



IMPORTANT NOTES:

- Attribute information cannot stand-alone; it must always be accompanied by a GTIN.
- Attribute information can be added as an additional bar code symbol to an existing EAN-13, UPC-A, or ITF-14using a GS1-128 or a GS1 DataBar Bar Code Symbol, which is representing a GTIN.
- Application identifiers represented in human readable format, below the bar code are surrounded by parenthesis (brackets) for ease of identification. These brackets are not encoded in the bar code.
- Attribute information can be applied to either a standard GTIN or to a variable measure GTIN.
- If an AI is used more than once (e.g. if a label is applied twice to a trade item), it must be followed by the same information. This restriction ensures the non-ambiguous interpretation of each AI.
- Attribute information cannot be scanned at the retail Point-of-Sale unless it is encoded in a GS1

DataBar Bar Code Symbol and the POS systems are appropriately enabled.[6]

For further information regarding the use of Application Identifiers please refer to the technical literature supplied by GS1 or contact GS1.

6.2.3 Serial Shipping Container Code (SSCC)

The Serial Shipping Container Code (SSCC) is a standard identification number, used for the unique identification of logistic (transport and/or storage) units.

A logistic unit is an item of any composition established for transport and/or storage, which needs to be managed through the supply chain.

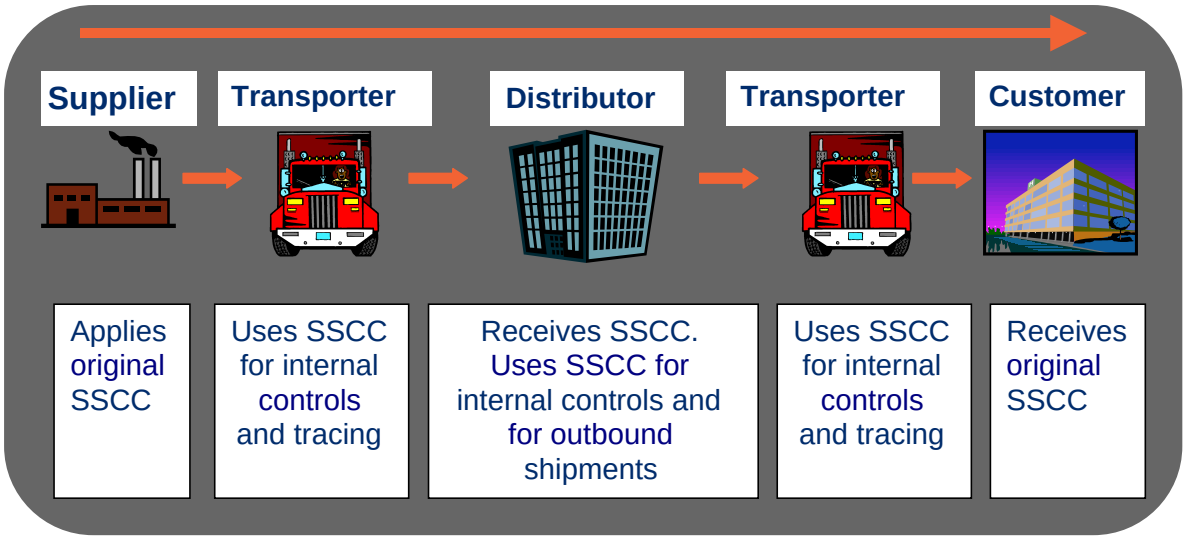
Scanning the SSCC marked on each logistic unit allows the physical movement of units to be individually tracked and traced by providing an information flow. It also opens up the opportunity to implement a wide range of applications such as cross docking, shipment routing, automated receiving etc.

The SSCC is used to uniquely identify goods on the way from sender to final recipient, and can be used by all participants in the transport and distribution chain. Each shipping container or logistic unit, at the time of its creation, is uniquely identified by the sender with an SSCC. A label encoding the SSCC is applied to the logistic unit using the appropriate AI and the GS1-128 Bar Code Symbol.

The SSCC uniquely identifies the entity (i.e. the shipping container or logistic unit to which the SSCC is applied) for the lifetime of that unit.

The SSCC can be used by all parties in the supply chain as a reference number or license plate to extract all the relevant shipping container information held in computer files within the receiver's information systems. The SSCC acts as a "reference key" which unlocks the information in the computer systems.

Diagram 5: The Use of the SSCC throughout the supply chain



It is essential that the recipient, the transport company, distributor or customer, of the transport unit with the SSCC attached, receive prior advice about the details of the transport unit and the SSCC. This advice is usually communicated via Electronic Data Interchange (EDI), which is the computer-to-computer exchange of business messages in a standard format.

There may be instances where all parties relevant to a particular shipment are not fully EDI capable

[6] The sunrise date for open use of GS1 Data Bar is 2010. Until this date, GS1 DataBar can only be used by trading partner agreement.

and where only some EDI messages are being exchanged. In this situation there may be a requirement to add additional information to the logistics label to facilitate the process of the logistic units through the supply chain. Alternatively the whole supply chain may be fully EDI capable and the whole suite of shipping messages is being exchanged.

Refer to Section 8 for further information on SSCCs.

6.2.4 Global Location Numbers (GLN)

The Global Location Number (GLN) is used to identify a company or organisation as a legal entity. GLNs can also be used to identify physical locations and legal entities within the company.

The use of GLNs is a pre-requisite for efficient Electronic Data Interchange (EDI).

Please refer to Section 15.2 for further information on GLNs.

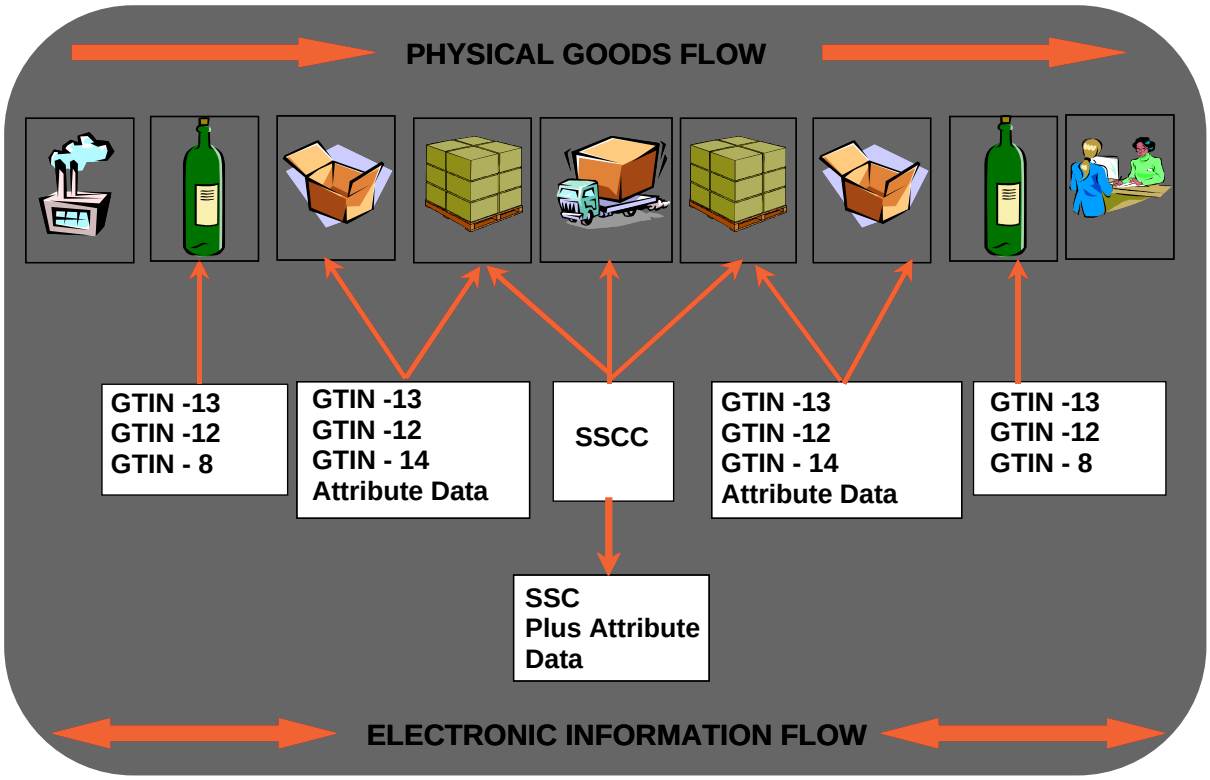
6.2.5 Asset Numbering

The GS1 standard provides a method for the identification of assets. The object of asset identification is to identify a physical entity as an inventory item.

Asset Identifiers may be used for simple applications, such as the location and use of a given fixed asset (e.g. a personal computer), or for complex applications such as recording the characteristics of a returnable asset (e.g. a reusable beer keg), its movements, its life-cycle history and any relevant data for accounting purposes.

Within this guideline, Asset Numbering has not been covered in any further detail. If however you require further information please consult the technical literature supplied by GS1 or contact GS1).

Diagram 6: GS1 Identification across the Supply Chain



6.3 The Data Carriers - Bar Code Symbols

6.3.1 Introduction

Bar codes are the principal data carriers used in the GS1 standards. Other data carriers may be introduced in the future such as two-dimensional codes, radio frequency tags etc.

Within the GS1 standards there are a number of different data carriers (bar code symbols) used for different applications throughout the supply chain. Determining which is the correct bar code symbol to use is generally determined by application of the trade item, logistic unit etc through the supply chain.

Some bar code symbols must be used in certain parts of the supply chain, particularly relevant to the retail Point-of-Sale sector. In any case final consideration of the item's path through the supply chain will aid in the determination of the correct bar code symbol type.

If in doubt please consult GS1 for further information.

The four data carrier types are:

- EAN/UPC Symbology[7]
- ITF-14 Symbology
- GS1-128 Symbology
- GS1 DataBar Symbology[8]

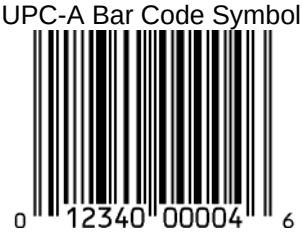
6.3.2 EAN/UPC Symbology

The EAN/UPC Symbology (which includes the UPC-A, UPC-E, EAN-13, and EAN-8 Bar Code Symbols) is part of a suite of GS1 standard barcodes that can be read omni-directionally. It **must be** used for all items that are scanned at the Point-of-Sale and may be used on other trade items throughout the entire supply chain.

Figure 1: Examples of EAN-13, EAN-8, UPC-A and UPC-E Bar Code Symbols

EAN-13 Bar Code Symbol

UPC-A Bar Code Symbol



EAN-8 Bar Code Symbol

UPC-E Bar Code Symbol

Unless products are to be sold in the North America and/or Canada companies will generally use the EAN-13 Bar Code Symbol. Please consult with GS1if your trade item is to be sold within North

[7] Symbology is a technical term used for bar code symbol or data carrier type.
[8] Formerly known as *Reduced Space Symbology* (RSS)

America and/or Canada as some North American retailers may be unable to scan EAN-13 Bar Code Symbols.

6.3.3 GS1 DataBar Symbology

The GS1 DataBar Symbology, previously known as Reduced Space Symbology (RSS) is a suite of seven bar code symbols. Each symbol is capable of encoding a GTIN and two of them can encode attribute information also. The effect of using GS1 DataBar is to encode the same information in less space than is possible with other symbologies, or more information in approximately the same space. Four of the GS1 DataBar bar code symbols are available for use at the Point-of-Sale once the systems are enabled.

GS1 has announced a sunrise date of 2010 for open scanning of these symbologies, i.e., all scanning systems to be able to read GS1 DataBar symbols and the AIs encoded in the symbols. Until this date GS1 DataBar may be implemented by trading partner agreement.

Figure 2: Examples of GS1 DataBar Bar Code Symbols

GS1 DataBar Omnidirectional

GS1 DataBar Stacked Omnidirectional

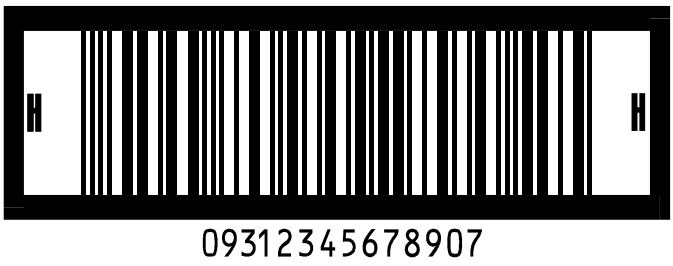
The other two POS-compatible GS1 DataBar Bar Code Symbols, GS1 DataBar Expanded and GS1 DataBar Expanded Stacked are identical in appearance but may be larger depending on the amount of data encoded. In addition, the GS1 DataBar-14 Truncated, Limited and Stacked are available for use in non-retail or general distribution environments.

More information about GS1 DataBar can be found in Appendix 15.3.1.

6.3.3 ITF-14 Symbology

The ITF-14 Bar Code Symbol (Interleaved 2-of-5) is restricted to use on trade items **not** passing through the retail Point-of-Sale.

Figure 3: Example of an ITF-14 Bar Code Symbol



6.3.4 GS1-128 Symbology

GS1-128 is a variant of Code 128. GS1 exclusively licenses its use. This is an extremely flexible bar code symbol and is used for the representation of GS1 Application Identifiers. It is **not** to be read on items passing through the Point-of-Sale.

Figure 4: GS1-128 Bar Code Symbol

For printing of all GS1 bar code symbols on trade items the standards as specified in the technical literature supplied by GS1 are applicable. Advice on this is also available from GS1.

(01)09312345678907

6.3.5 Choosing the Correct Data Carrier (Bar Code)

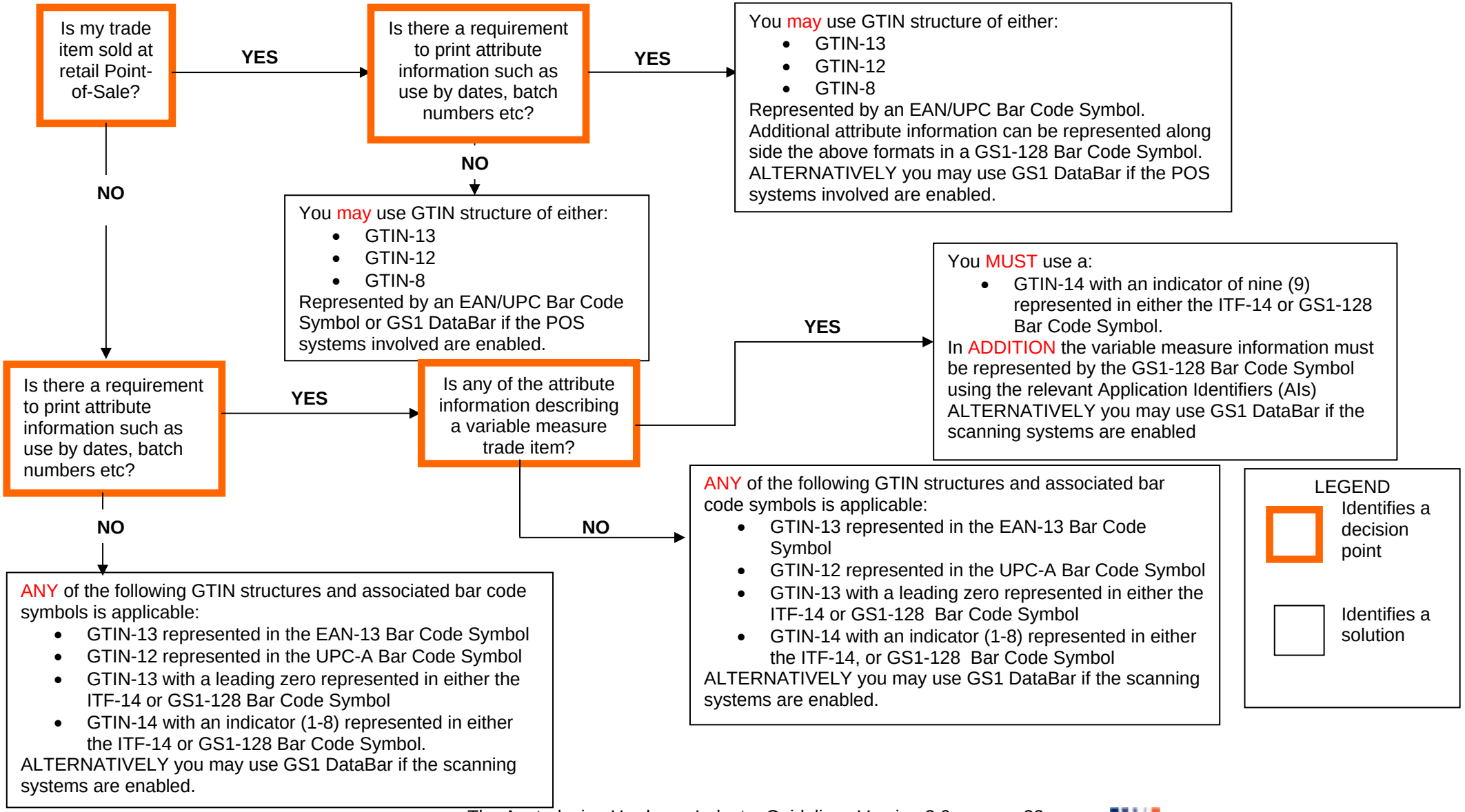
As described above, the path the trade item will take through the supply chain generally determines the choice of which data carrier to use. Whilst choice can often seem complex, sticking to a few simple guides can often assist this process.

Some of the following questions may assist in the determination of the correct data carrier to be used:

- Will the trade item ultimately be sold at the retail Point-of-Sale?
  If YES then the data carrier choice may be EAN/UPC Symbology, unless space constraints are an issue, in which case GS1 DataBar may be used, providing if the scanning and computer systems at the retail Point-of-Sale are enabled
- Is there a requirement to print additional information such as serial numbers?
  If YES then the data carrier may be the GS1-128 Symbology, which is not usable at the Point-of-Sale or alternatively, GS1 DataBar if the scanning and computer systems at the retail Point-of-Sale are enabled
- What printing method will be used to print the data carrier?
  Some data carriers require more specific print methods than others; hence one may be more suitable than the other.

The following flow chart can assist in making the most suitable decision over which GTIN format and data carrier will suit your application. For further information please consult GS1.

Diagram 7: GTIN and Data Carrier Decision Flow Chart



6.3.6 Summary of GTIN and Bar Code Symbol Options

The following depicts a summary of the GTIN and bar code symbol options available and the applicable points through the trading supply chain for use. It is important to remember that there is currently a limitation around use of GTINs of a length greater than 13 digits, due for scanning at Point-of-Sale. Whilst in the long term, this will be rectified; currently the majority of POS systems are bound by this constraint.

Table 3: GTIN and Bar Code Format Options

	Bar code format				
GTIN structure	**Identifier Length (digits)**	**EAN/UPC**	**GS1 DataBar**	**GS1-128**	**ITF-14**
GTIN - 8	8	Trade Items sold at retail POS	N/A	N/A	N/A
GTIN -12	12	Trade Items sold at retail POS	N/A	N/A	N/A
GTIN-13	13	Trade Items sold at retail POS AND Trade items NOT sold at retail POS	N/A	N/A	N/A
GTIN-12 with two leading 0	14	N/A	Trade Items sold at retail POS AND Trade items NOT sold at retail POS	Trade items NOT sold at retail POS	Trade items NOT sold at retail POS
GTIN-13 with a leading zero.	14	N/A	Trade Items sold at retail POS AND Trade items NOT sold at retail POS	Trade items NOT sold at retail POS	Trade items NOT sold at retail POS

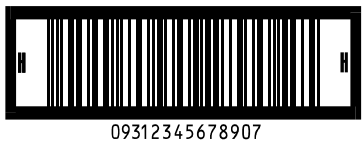
GTIN structure	Bar code format				
	Identifier Length (digits)	EAN/UPC	GS1 DataBar	GS1-128	ITF-14
GTIN-14 with an indicator 1-8	14	N/A	Trade Items sold at retail POS[9] AND Trade items NOT sold at retail POS	Trade items NOT sold at retail POS	Trade items NOT sold at retail POS
Variable Measure GTIN-14 with leading 9	14	N/A	Trade Items sold at retail POS[10] AND Trade items NOT sold at retail POS	Trade items NOT sold at retail POS	N/A
Attribute information, e.g. Batch number, Use by date, Variable measures	n/a	N/A	Trade Items sold at retail POS AND Trade items NOT sold at retail POS	Trade items NOT sold at retail POS Can be used as an additional bar code symbol with EAN/UPC or ITF-14 Bar Codes	N/A
SSCC	18	N/A	N/A	Logistic Units	N/A

The relationship between the GTIN and the bar code symbology used can also be graphically represented as shown in Diagram 8.

[9] Due to POS System constraints, GTIN-14 encoded in GS1 DataBar may not be able to be scanned at POS at the time of the sunrise date (2010), however this capability will be developed at a later date. If you are going to implement GS1 DataBar containing GTIN-14, it is recommended you consult your trading partners.

[10] As above.

Diagram 8: GTIN formats and Bar Code Symbologies

Total GTIN Length	Bar Code Symbology Used
8 digits (GTIN – 8)	EAN-8 Bar Code Symbol 
12 digits (GTIN – 12)	UPC-A Bar Code Symbol  OR UPC-E Bar Code Symbol[11] 
13 digits (GTIN – 13)	EAN-13 Bar Code Symbol 
14 digits (GTIN – 14, GTIN – 13 with a leading zero or GTIN-12 with 2 leading 0)	ITF-14  OR GS1-128  OR GS1 DataBar 

[11] When the GTIN-12 is of the format allowing zero suppression.

7 How to Number and Bar Code Trade Items

The following section describes the method by which a GTIN can be assigned and the appropriate bar code symbol to be used on trade items. Specific examples and scenarios of product types found in the various sectors of the Hardware Industry can be found towards the latter section of this document.

Under the GS1 standards all of the options given below are available for numbering and bar coding of trade items.

The options available for creating the GTINs for trade items are: -

- Allocate a unique GTIN-13 represented in an EAN-13 Bar Code Symbol required when the trade item will be sold at the POS (Point-of-Sale)
- Allocate a unique GTIN-13 with a filler zero (leading zero) represented in either the ITF-14, GS1-128 or GS1 DataBar Bar Code Symbol
- Allocate an GTIN-14 with an indicator (logistical variant, 1-8) represented in either the ITF-14, GS1-128 or GS1 DataBar Bar Code Symbol
- Allocate a GTIN-14 with an indicator 9 represented in either the ITF-14 or GS1-128 Bar Code Symbol (this option is **only** applicable to variable measure trade items).

Note: The description of the format of the GTIN-12, GTIN-8 number structures and the EAN-8 and UPC-E bar code symbols have not been included in this guideline. If you require further information regarding the formats of these numbers either consult the technical literature supplied by GS1 or contact GS1***.***

Regardless of the method by which a GTIN is assigned it is important always to assign separate GTINs to every different variant of a product. Size, style, grade, colour etc are all considered separate variants and thus require separate GTIN's.

Any change to trade items such as weight, description etc may require the allocation of another GTIN. Refer to GS1 Australia's web site, tool, "When to Change a GTIN"

http://www.gs1au.org/services/gtin/_gtin.asp
Contact GS1 for further information.

When allocating GTINs in any of the above-mentioned formats GS1 recommends that no significance is created within the GTIN itself. Data is linked via a database to the GTIN, thus no level of understanding is required within the number itself.

Note: Do not re-use an obsolete GTIN until a minimum of four years after the date that you last issued the trade item into the market place. Companies may choose to extend the period of time before a GTIN is re-used beyond the minimum of four years. This is perfectly acceptable.

7.1 Trade Items Sold at Retail Point-of-Sale (POS)

7.1.1 Definition

Any trade item intended for sale to the final consumer through retail Point-of-Sale is more commonly known as a **RETAIL ITEM or CONSUMER UNIT**.

Any trade item that could be sold at the retail Point-of-Sale as well as traded through the distribution supply chain is numbered and the type of bar code symbol selected according to the rules applicable to trade items sold at retail POS.

Note: The description of the format of the GTIN-12, GTIN-8 number structures and the EAN-8 and UPC-E bar code symbols have not been included in this guideline. If you require further information regarding the formats of these numbers either consult the technical literature supplied by GS1 or contact GS1.

7.1.2 Format of the GTIN-13

Trade items that are sold at the retail POS are generally allocated a GTIN-13. This number is represented in an EAN-13 Bar Code Symbol.

Unless products are to be sold in North America and/or Canada companies will generally use the EAN-13 Bar Code Symbol. Please consult with GS1 if your trade item is to be sold within North America and/or Canada as some North American retailers may be unable to scan EAN-13 Bar Code Symbols.

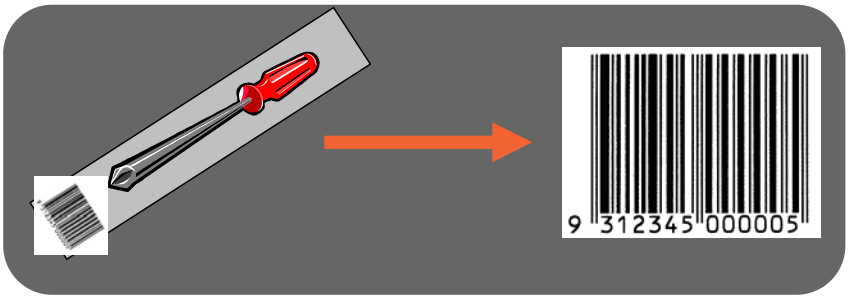
The format of the GTIN-13 is:

GS1 Company prefix:	The GS1 Company Prefix is allocated by the GS1 member organisation. This is usually nine digits long although there may be exceptions. These guidelines are written on the assumption that a nine-digit GS1 Company Prefix is used.
Item reference:	A unique non-significant number for each individual trade item. Generally issued sequentially, 000, 001, 002 etc for each different variant of a product.
Check Digit:	Validates the accuracy of the entire number by mathematical formula

Figure 5: Example of EAN-13 Bar Code Symbol representing the GTIN-13

Refer to the technical literature supplied by GS1 for further information on the format of the GTIN-8 and GTIN-12.

Diagram 9: Example of a trade item carrying a GTIN-13 represented in an EAN-13 Bar Code Symbol



Note: The location of the label is for demonstration purposes only.

7.2 Trade Items NOT Sold at Retail Point-of-Sale (POS)

7.2.1 Definition

Trade items that are any standard grouping of items made up to facilitate the operations of handling, storing, order preparation, shipments etc and may often be referred to as **NON-RETAIL TRADE ITEMS.**

A trade item may be a single, non-breakable unit. It may also be a standard and stable grouping of a series of single items. Such a unit may be presented in a wide variety of physical forms: a fibreboard carton, a covered or banded pallet, a film wrapped tray, a crate with bottles, etc. Trade items consisting of single units are identified with a unique Global Trade Item Number (GTIN); standard groupings of identical or different units are identified with separate unique GTINs.

It is recognised that beyond the trade item sold at retail Point-of-Sale, there can be many different levels of packaging of trade items. The first level of packaging, which is not likely to be sold at retail Point-of-Sale, is considered to be the lowest level trade item (these are normally referred to as **INNERS OR INTERMEDIATE** packs). The last level of packaging (the outer most) is considered to be the highest level; this is up to but not including the pallet. However, this does not preclude suppliers from issuing GTINs to pallets if they desire to identify the pallet itself as a trade item. If supplier trade full pallets, then it is recommended a GTIN be issued to the pallet.

Note: Each individual level of trade item must be uniquely identified with a different GTIN.

7.2.2 Options for Trade Items NOT Sold at Retail Point-of-Sale (POS)

A trade item **not** sold at retail POS can be numbered and bar coded with any one of the following numbering options:

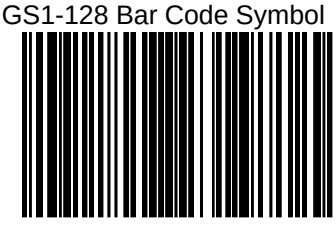
- GTIN-13 represented in and EAN-13 Bar Code Symbol (refer to Section 7.1)
- GTIN-13 with a filler zero represented in either the ITF-14 or GS1-128 Bar Code Symbol (refer to Section 7.2.3)
- GTIN-14 represented in either the ITF-14 or GS1-128 Bar Code Symbol (refer to Section 7.2.4)
- For variable measure products, allocate a GTIN-14 with an indicator 9 represented in either the ITF-14 or GS1-128 Bar Code Symbol (this option is **only** applicable to variable measure trade items refer to Section 7.3).

Figure 6: Examples of the Bar Code options for Trade Items Not Sold at Retail POS

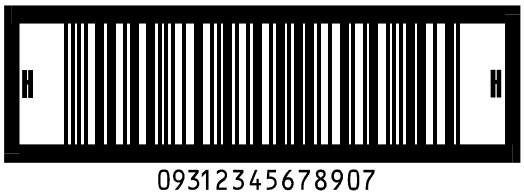
EAN-13 Bar Code Symbol

UPC-A Bar Code Symbol

GS1-128 Bar Code Symbol



ITF-14 Bar Code Symbol



Note: Data carrier (bar code symbol) sizes are not to scale. GS1 DataBar may not be first choice for use on Trade Items Not Sold at Retail POS because the size of such items allows the use of bigger bar code symbols but GS1 DataBar could be used if the size of the item required it, provided the scanning systems involved in the handling of the item are suitably enabled.

7.2.3 Creating a GTIN by Allocating an GTIN-13 with a Filler Zero (Leading Zero)

A GTIN-13 with a filler zero (leading zero) is created by allocating a unique GTIN-13, which is then preceded with a filler zero (leading zero). When a GTIN is formed with a filler zero (leading zero), the 13 characters must be unique, that is, you must **not** repeat the GTIN allocated to any other trade item.

The format of the GTIN-13 with a filler zero is:

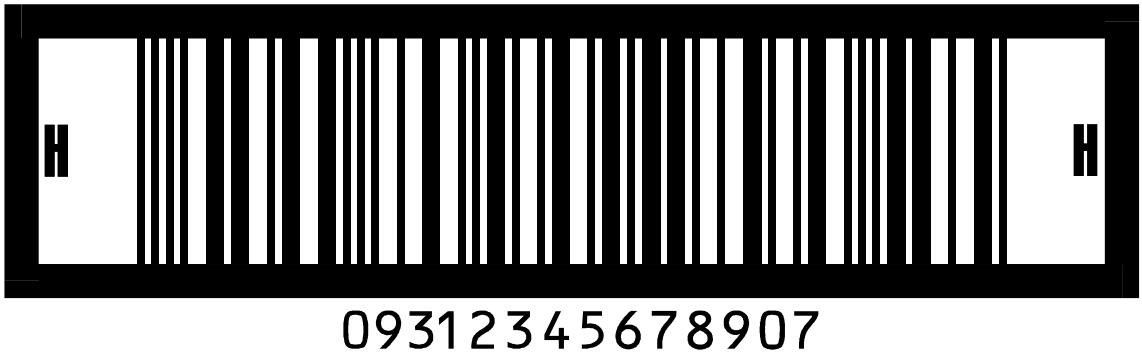
Filler zero (Leading zero):	Precedes a unique GTIN-13 (refer to section 7.1.2). If using this method to create a GTIN for a shipper (carton) containing retail trade items, the GTIN-13 **MUST NOT** be the same as the GTIN on the trade items sold at retail POS. In any case it must not be the same as any other GTIN-13 already in use.
GS1 Company prefix:	The GS1Company Prefix is allocated by the GS1 member organisation. GS1 Australia and GS1 New Zealand usually allocate a nine-digit GS1 Company Prefix (in the past seven-digit GS1Company Prefixes were issued). This guideline has been written with the assumption that a nine-digit prefix has been issued.
Item reference:	A unique non-significant number for each individual trade item.
Check Digit:	Calculated using a mathematical formula.

The GTIN-13 with a filler zero can be represented in either GS1 DataBar, ITF-14 or GS1-128 Bar Code Symbols.

Note: If choosing to represent the GTIN-13 with a filler zero represented in GS1 DataBar or GS1-128 bar code symbols, an Application Identifier 01 must precede the number. The AI (01) identifies that the following number is a GTIN with a fixed length of 14 digits see Figure 7 below.

Figure 7: GTIN-13 with a filler zero represented in GS1 DataBar or GS1-128 Bar Code Symbol

Figure 8: GTIN-13 with a filler zero represented in an ITF-14 Bar Code Symbol.



7.2.4 Creating a GTIN-14.

The GTIN-14 is created by prefixing the existing GTIN of the retail/consumer trade item with an indicator (logistical variant), which is a number between 1 and 8 and recalculating the Check Digit. Different indicators are used to identify different levels of trade items not sold at retail Point-of-Sale. Indicators should be non meaningful and are used only to create additional unique 14 digit GTIN. This method is not used to create numbers for use in GS1 DataBar Bar Code Symbols intended for scanning at retail POS.

The format of the GTIN-14 is:

Indicator (logistical variant 1-8):	Precedes the first twelve digits of the GTIN-13 of the lowest level of trade item contained within the non-retail trade item.
GS1 Company prefix:	The GS1 Company Prefix is allocated by the GS1 member organisation. GS1 Australia and GS1 New Zealand allocate a nine-digit GS1 Company Prefix (in the past seven-digit GS1 Company Prefixes were issued).
Item reference:	A unique non-significant number for each individual trade item.
Check Digit:	Calculated using a mathematical formula.

Note: For information on creating an GTIN-14 where the GTIN of the retail/consumer item within the trade item carries a GTIN-8 please refer to the technical literature supplied by GS1 for further information

Note: If choosing to represent the GTIN-14 in the GS1-128 Bar Code Symbol, an Application Identifier 01 must precede the number. The AI (01) identifies that the following number is a GTIN with a fixed length of 14 digits see Figure 9 below.

Figure 9: GTIN-14 with an indicator represented in a GS1-128 Bar Code Symbol

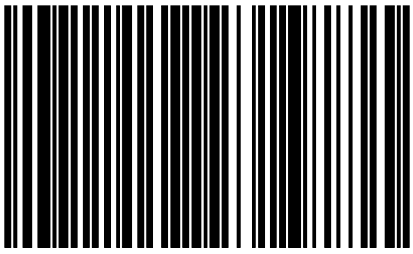
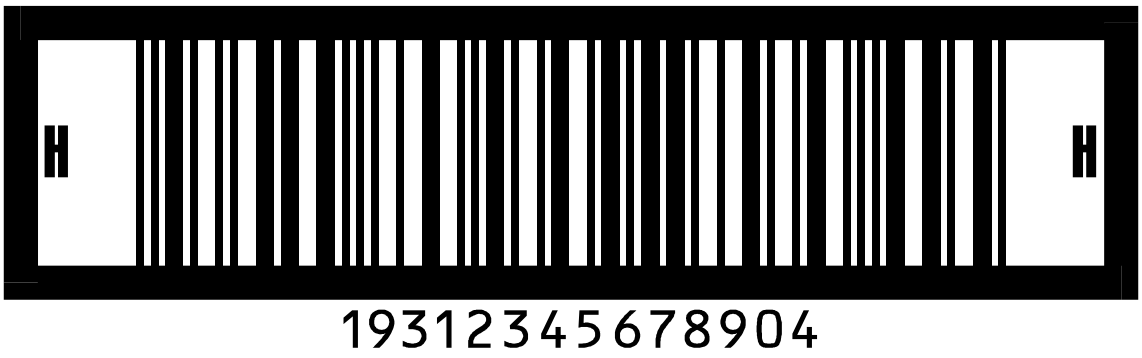


Figure 10: GTIN-14 with an Indicator represented in an ITF-14 Bar Code Symbol.



7.3 Numbering and Bar Coding of Variable Measure Trade Items NOT Sold at Retail Point-of-Sale (POS)

Trade items may be of variable measure either because the production process does not guarantee consistency in weight, size or length (carcasses of meat, lengths of timber etc) or because the items are created to meet a special order which states a quantity (e.g. textiles ordered by the metre, glass ordered by the square metre).

Only trade items that are sold, ordered or produced in quantities which can vary continuously are covered by the rules outlined below. Trade items, which are sold in discrete and pre-defined units (e.g. as a nominal weight), are treated as fixed measure trade items.

A trade item must be considered to be variable measure if its measure is variable at any point in the supply chain. For example, a supplier may sell and invoice timber in standardised bundles of a total of 10 metres, but the number of pieces of timber may vary. The customer, a retailer in this example, may need to know the exact number of pieces of timber contained in each bundle in order to organise the distribution to his stores. In this example, the supplier should source mark the trade item by using a variable measure GTIN and a variable count AI.

The GTIN-14 with the indicator **"9"** is used to identify a variable measure trade item. The presence of the variable measure information is mandatory for the complete identification of a particular variable measure trade item. The digit **"9"** in the first position is an integral part of the 14-digit GTIN.

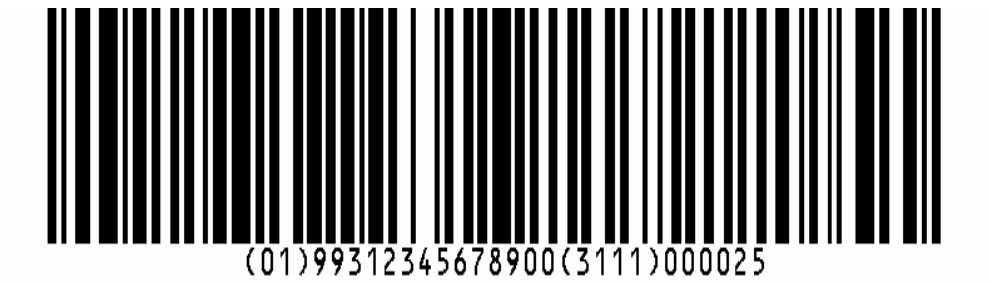
Note: Variable measure information represented in the following matter cannot be scanned at the retail Point-of-Sale (POS) unless the bar code symbol used is GS1 DataBar Expanded and the scanning and computer systems at the POS has been suitably enabled. Because of the size of the packaging of most trade items Not Sold at Retail POS and the fact that they are not intended for retail sale as intact units, the use of GS1 DataBar is an unlikely option.

The format of the variable measure GTIN (used in this illustration on a variable measure unit in which the varying measure is length in metres) is:

Application Identifier (01)	GS1 Global Trade Item Number (GTIN).
Indicator "9"	Indicating that the trade item is of variable measure.
GS1 Company prefix:	The GS1 Company Prefix is allocated by the GS1 member organisation. GS1 Australia and GS1 New Zealand usually allocate a nine-digit GS1 Company Prefix (in the past seven-digits GS1 Company Prefixes were issued).
Item reference:	Item reference allocated by the company to each different item.
Check Digit:	Calculated using a mathematical formula.
Application Identifier (311n)[12]	The 'n' in this AI signifies the numeric position of a decimal place. In the example below the decimal spot is 1 place from the right to give the length 2.5 metres.

[12] The Application Identifier 311n has been used as an example. Any of the measure AIs available can be used as appropriate to the attribute being expressed.

Figure 11: Variable measure trade item number with a length of 2.5 metres



Note: For further information on Application Identifiers see Section 6.2.2 and consult the technical literature supplied by GS1.

8 How to Number and Bar Code Logistic Units

As described in Section 6.2.3, the Serial Shipping Container Code (SSCC) is a GS1 Identification Key, used for the unique identification of logistic (transport and/or storage) units.

8.1 How to Allocate the Serial Shipping Container Code (SSCC)

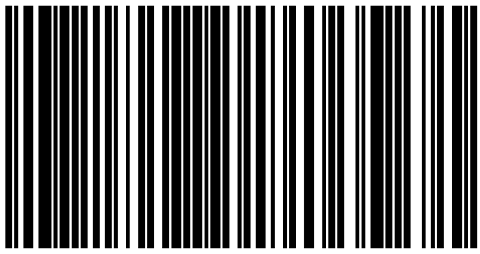
The SSCC should be handled as an *18-digit non-significant number* uniquely identifying the unit to which it is attached. To ensure worldwide uniqueness, the following general code structure has been defined by GS1.

Each Logistic Unit, at the time of its creation is uniquely identified by the sender with an SSCC

The format of the Serial Shipping Container Code is:

Application Identifier (00)	Serial Shipping Container Code (SSCC)
Extension Digit	A digit (0-9) used to increase the capacity of the serial reference within the SSCC. The company that constructs the SSCC assigns it to the logistic unit.
GS1 Company prefix:	The GS1 Company Prefix is allocated by the GS1 member organisation. GS1 Australia and GS1 New Zealand usually allocate a nine-digit GS1 Company Prefix (in the past seven-digits GS1 Company Prefixes were issued). It makes the SSCC unique worldwide but does not identify the origin of the unit.
Serial reference:	A serial number comprises either seven digits (nine if the GS1 Company Prefix is seven digits) and uniquely identifies each transport package or logistic unit. The method used to allocate a unique number is at the discretion of the company coding the package, but sequential allocation is recommended.
Check Digit:	Calculated using a mathematical formula.

Figure 12: Serial Shipping Container Code (SSCC)



(00)393123451234567891

8.2 The GS1 Logistics Label

The various trading partners involved in a distribution channel have different information needs. The information flow which accompanies the physical flow of goods is communicated between trading partners by various means. Electronic Data Interchange (EDI) is the way to transmit information along the supply chain.

In practice, however, fully automated communication channels, which make it possible to rely exclusively on electronic files for retrieving information on the movements of the goods, are not always available.

For this reason, there is a need to indicate relevant information on the goods themselves, in addition to their identification. The various fields of information need to be organised in a standard way in order to facilitate their interpretation and processing by all trading partners in the supply chain.

The purpose of the GS1 Logistics Label is to provide information about the unit to which it is fixed, clearly and concisely. The core information on the label should be represented both in machine (bar code) and human readable form. There may be other information, which is represented in human readable form only.

This GS1 Logistics Label can be applied to a single item, or a grouping of several items made up to facilitate the operation of handling, storing and shipping. This can be:

- A carton
- A pallet
- A group of shrink wrapped units
- A tray
- A container
- Or any other similar type of packaging created for the purpose of handling, storing or shipping.

The information following is a reference for the design of logistics labels. This application is supported and complimented by Application Identifiers and the GS1-128 Bar Code Symbology. These are important components of the logistics label that apply to all of the specifications relating to the logistics label.

The structure and layout for logistics labels is explained, however, emphasis is given to the basic requirements for practical application in an open trade environment. The major areas include:

- the unambiguous identification of logistics units
- the efficient presentation of text and machine readable data (bar code symbols)
- the information requirements of key partners in the supply chain– suppliers, customers and carriers
- technical parameters to ensure systematic and stable interpretation of the labels.

This is applicable to any type of logistic unit marked with a Serial Shipping Container Code (SSCC), which is used in logistic and transport applications where there is a need to track and trace individual units or a grouping of units being a part of the same transport transaction.

8.2.1 Components of the GS1 Logistics Label

Information represented on GS1 Logistics Labels has two basic forms:

- Human Readable Information –usually comprising of text and graphics, e.g. 'to' and 'from' addresses
- Bar codes (machine readable form)–a secure and efficient method of conveying structured data

The human readable text allows general access to basic information at any point in the supply chain. However, both methods of information representation provide value to the GS1 Logistics Label and often co-exist on the same label.

The mandatory field for all logistics labels is the Serial Shipping Container Code (SSCC), AI (00). The SSCC is a unique identification number assigned to each specific logistics unit. In principle the SSCC is sufficient for all logistic applications.

In an environment where Electronic Data Interchange (EDI) is used to transmit the detailed information pertaining to each logistic unit, or where the information is already within a database, the SSCC acts as the reference point to information.

However, when EDI is not available at each point in the supply chain, or when redundancy is desired, certain additional elements of information are desirable. Each of these is also represented through the use of Application Identifiers (AIs).

8.2.2 Label Design

The design of the logistics label accounts for the supply chain process by grouping information into three logical sections.

A section is a logical grouping of information that is generally known at a particular time.

- Supplier section
- Customer section
- Carrier section

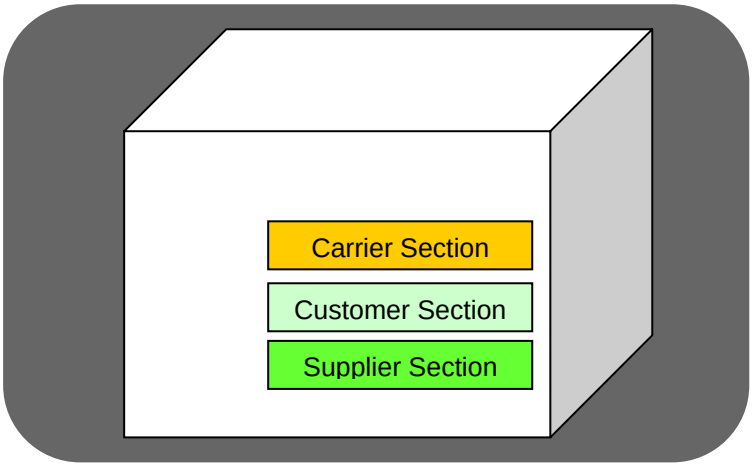
Each label section may be applied at a different point in time, as the relevant information becomes known.

Within each section bar code symbol information is separated from text information to facilitate separate processing by automatic data capture and people. Bar codes are represented in the lower part of each section, while human readable information is shown in the upper part of the section. This facilitates access to each component as required.

The organisation responsible for the printing and application of the label, determines the content format and dimensions of the label.

Further information regarding the type of data included in these sections can be obtained from the technical literature supplied by GS1.

Diagram 10: Label sections represented separately on a logistic unit



8.2.3 Label Dimensions

The company applying the label to the logistic unit determines the physical dimensions of the label. However, the size of the label should be consistent with the information required in all sections of the label.

The A6 format (105mm x 148mm) is sufficient for most requirements and is the predominant label size used. Other sizes are usually variations that result from other information requirements or the logistic unit size. A recommended guide is that the width of the label should remain constant at 105mm, while the height of the label varies depending on information requirements.

8.2.4 Technical Specifications

The following sections identify specific aspects of the format of the logistics label to assist in the initial processes of development. Not all technical aspects have been provided within this document and companies should ensure that they consult the technical literature supplied by GS1 or contact GS1 for further information.

8.2.4.1 Bar Codes

The GS1-128 Bar Code Symbol shall be used for all information on the GS1 Logistics Label.

The number of GS1-128 Bar Code Symbols may be minimised by using the concatenation facility wherever possible. When not possible due to constraint of label size, data can be represented in multiple bar code symbols. The sequence of the bar code symbol data elements is irrelevant in terms of interpretation.

Note: The exception is the SSCC, which is the identifier for the logistics unit and the most fundamental element of the label. Due to the larger magnification recommended for the SSCC, concatenation is not feasible on a standard width label.

8.2.4.2 Bar Code Orientation and Placement

Bar codes shall be in picket fence orientation on a logistics unit. The bars and spaces shall be perpendicular to the base on which the logistic unit stands. In all cases, the SSCC shall be placed in the lowest portion of the label.

8.2.4.3 Text

Text is data that is not represented within any bar code symbol formats on the logistics label.

There are three types of text information, which can appear on a logistics label:

- Plain text
- Human translation
- Data titles

Further details can be found in the technical literature supplied by GS1.

8.3 GS1 Logistics Label Formats for the Hardware Industry

As described in Section 8 there is the ability to identify logistic units with the use of the Serial Shipping Container Code (SSCC). Where companies and/or industry sectors are not fully EDI capable there is often a need to identify additional data represented on the GS1 Logistics Label to assist processing of shipments through the supply chain.

The following section describes the minimum data set required on a GS1 Logistics Label for the Australasian Hardware Industry for use on logistic units of the following configuration:

- **Logistic unit containing the same trade items (See** Diagram **11)**
  this label format would be used in the instance where the trade items carry the same GTINs within the logistic unit. Data on this label is only applicable where the GTINs are all the same on the individual trade items, for example a pallet of 50 cartons of nails.

- **Logistic unit containing the same configuration of trade items (See** Diagram **12)**
  In the event that the logistic unit itself has been assigned a unique GTIN this label example can be used. This label format should be used when the trade item is a standard, stable and orderable trade item in itself. The logistic unit could consist of either a standard grouping of identical trade items or a standard mix of trade items.

- **Mixed trade items on the logistic unit from the same Purchase Order (See** Diagram **13)**
  When an order is picked and packed and is a mix of various trade items from one Customer Purchase Order this label format can be used.

- **Mixed trade items on the logistic unit from various Purchase Orders (See** Diagram **14)**
  In the event that a back order/s is filled thus consisting of various Customer Purchase Orders this example logistics label is required. Note full use of EDI is required to advise the customer of the information linked to the SSCC.

- **Where full EDI is applicable (See** Diagram **14)**
  In this example full use of EDI is applicable between trading partners. Here all the information is linked to the SSCC and this acts as the key to access all information about the logistic unit. This label format can be used on all types of logistic units from, standard groupings to mixed trade items. The only requirement is that EDI is fully operational between all trading partners throughout the supply chain.

Note: Information contained on the GS1 Logistics Label is negotiable between suppliers, customers and transporters/consolidators. These guidelines are in no way limit any other information, which may be required by each party in the supply chain.

Diagram 11: Example of the GS1 Logistics Label Format standard pallets

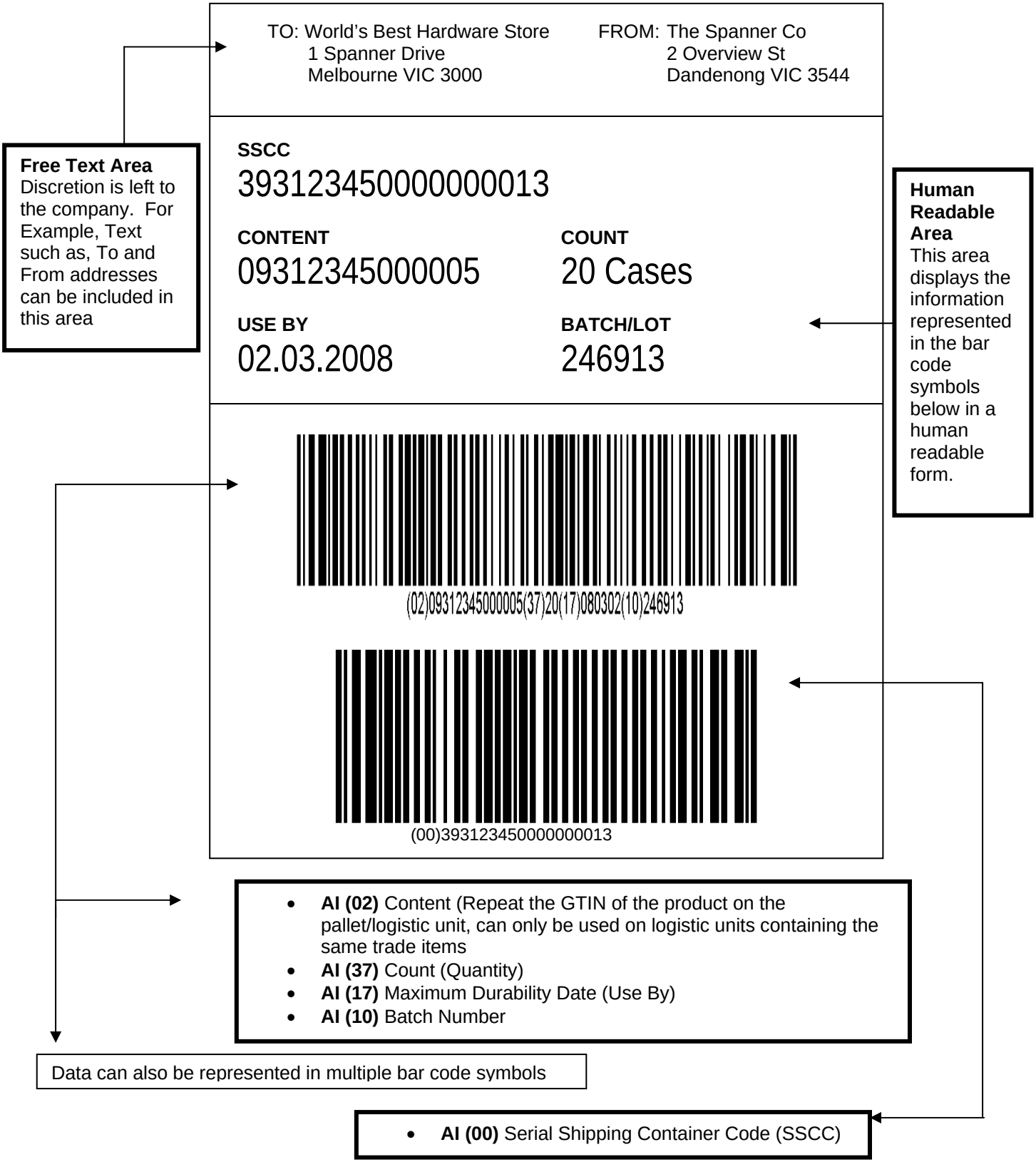


Diagram 12: Example of the GS1 Logistics Label Format standard pallets

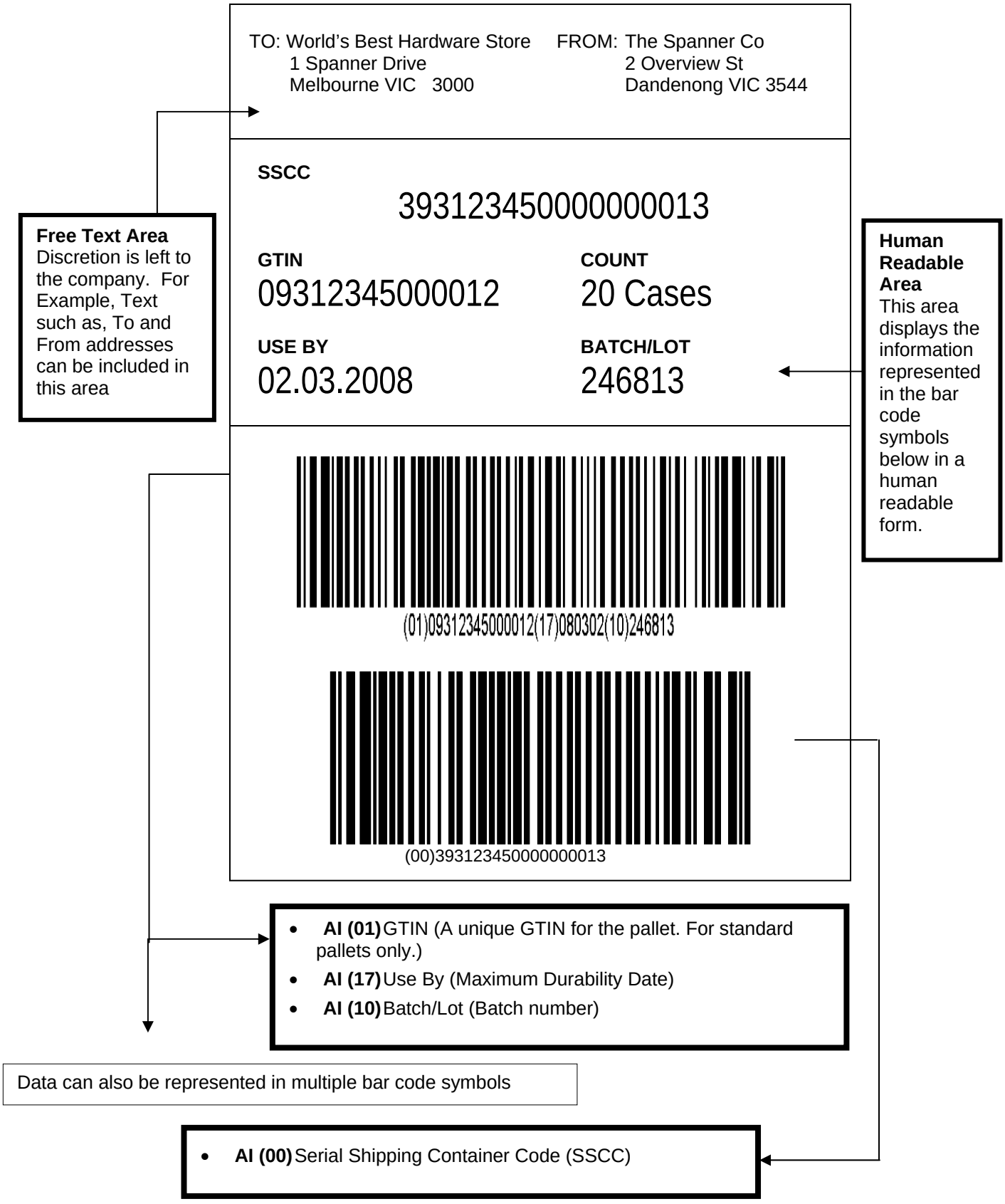


Diagram 13: Example of a GS1 Logistics Label Format mixed orders same Customer Purchase Order

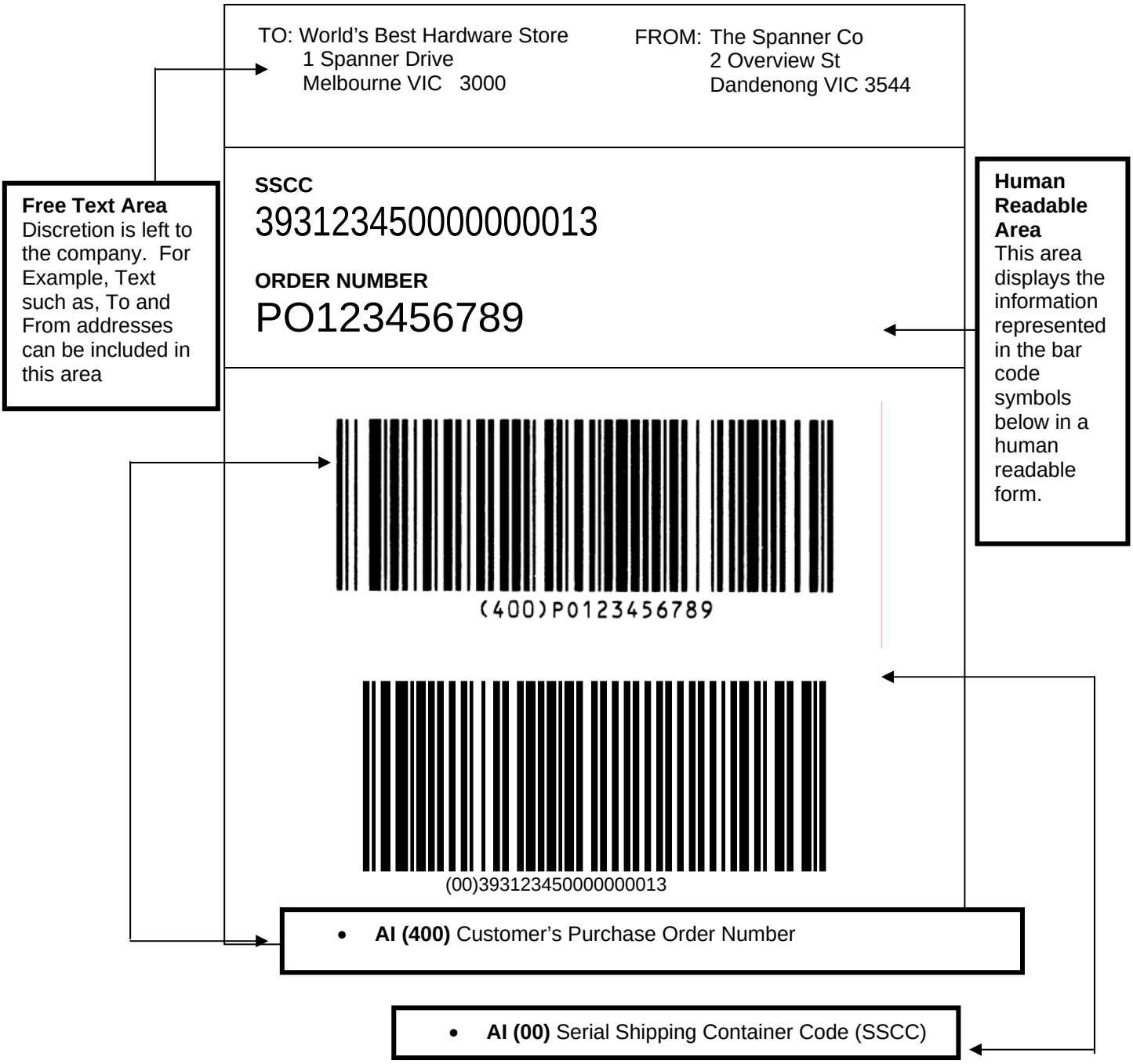


Diagram 14: Example of a GS1 Logistics Label Format mixed trade items with different Customer Purchase Order Numbers

Note: Full use of EDI is required when using the above label format to advise the trading partner of the information linked to the SSCC.

9 Location of the Bar Code Symbol on Trade Items and Logistic Units

Productivity and scanning accuracy improve considerably when the bar code symbol location is predictable. Consistency in the location of the bar code symbol achieves maximum productivity in any scanning environment.

9.1 Trade Items Sold at Retail Point-of-Sale (POS)

Where the trade item sold at retail POS is to be bar coded, the **general** location for bar code symbols on trade items is on the lower right quadrant of the back respecting the proper Quiet Zone areas around the bar code symbol and the edge rule.

The **edge rule** stipulates that the bar code symbol must not be closer than 8mm or further than 100mm from any edge of the package/container.

In the event that trade items are of an irregular or unusual shape, a common sense approach should be taken to ensure that the bar code symbol is located as close to the recommended guidelines stipulated ensuring that the scannability of the bar code symbol is not affected by its location.

More detailed guidelines for specific types of retail trade items can be found in the technical literature supplied by GS1.

9.2 Trade Items NOT Sold at Retail Point-of-Sale (POS)

In order of preference the recommended location for the bar code symbols printed on trade items not sold at retail POS are:

- Minimum of two adjacent vertical sides (one short side and the long side to the right)
- As an absolute minimum on one side **only where it is not reasonably practical to apply two bar code symbols on adjacent vertical sides. IF ONLY ONE LABEL IS APPLIED IT SHOULD BE PRINTED AT THE HIGHER END OF THE MAGNIFCATION RANGE OR AS LARGE AS IS PRACTICAL.**

ALL ATTEMPTS SHOULD BE MADE TO MAINTAIN 100% SCANNABILITY AT ALL TIMES.

The bar code symbol can be positioned anywhere along the face of the carton ensuring that the following recommendations are followed:

- the lower edge of the bars of the bar code symbol is exactly 32mm from the lower edge of the base of the carton.
- including Quiet Zones the bar code symbol should be located a minimum of 19mm from both vertical edges of the carton.

Note: With the ITF-14 Bar Code Symbol the outer edge of the left or right bearer bar should be a minimum of 19mm from both vertical edges of the side of the carton. This is to minimise damage to the bar code symbol.

Diagram 15: Wrap Around Label with Edge Separation

9.3 Logistic Units

The logistics label should ideally be located on a minimum of two adjacent vertical sides of the logistic unit, one on the short side and one on the long side to the right.

In the event that the product is not a standard carton or pallet of uniform shape all efforts should be made to try and meet the below mentioned recommendations to the best of ones ability. For irregular shaped shipments and the like common sense should direct the location of any logistics labels to ensure that the label is visible at all times.

Note: However, if only one label is applied, the side chosen needs to take into consideration the way the pallet will be picked. In this instance the label should be applied to the "pick side" of the pallet. Before taking this option, consultation with all trading partners is advised.

Consult the technical literature supplied by GS1 or contact GS1 for further information on logistic label location.

9.3.1.1 Units Less than 1 metre in Height

For cartons and other units less than 1 metre in height, pallets excluded, labels should be placed so that the lowest edge of the SSCC is 32mm from the base of the unit. Including Quiet Zones, the bar code symbol should be at least 19mm from both vertical edges.

Diagram 16: Location of the GS1 Logistics Label on a carton or unit less than 1 metre in height

If the unit is already marked with an EAN-13, UPC-A, ITF-14, GS1-128 or GS1 DataBar Bar Code Symbol for trade item identification purposes, the label should be placed so as not to obscure the pre-existing bar code symbol. The preferred location of the label in this case is to the side of the pre-existing bar code symbol, so that a consistent horizontal location is maintained.

Diagram 17: Location of the GS1 Logistics Label on a carton or unit less than 1 metre in height with the unit already marked with pre-existing bar code symbol

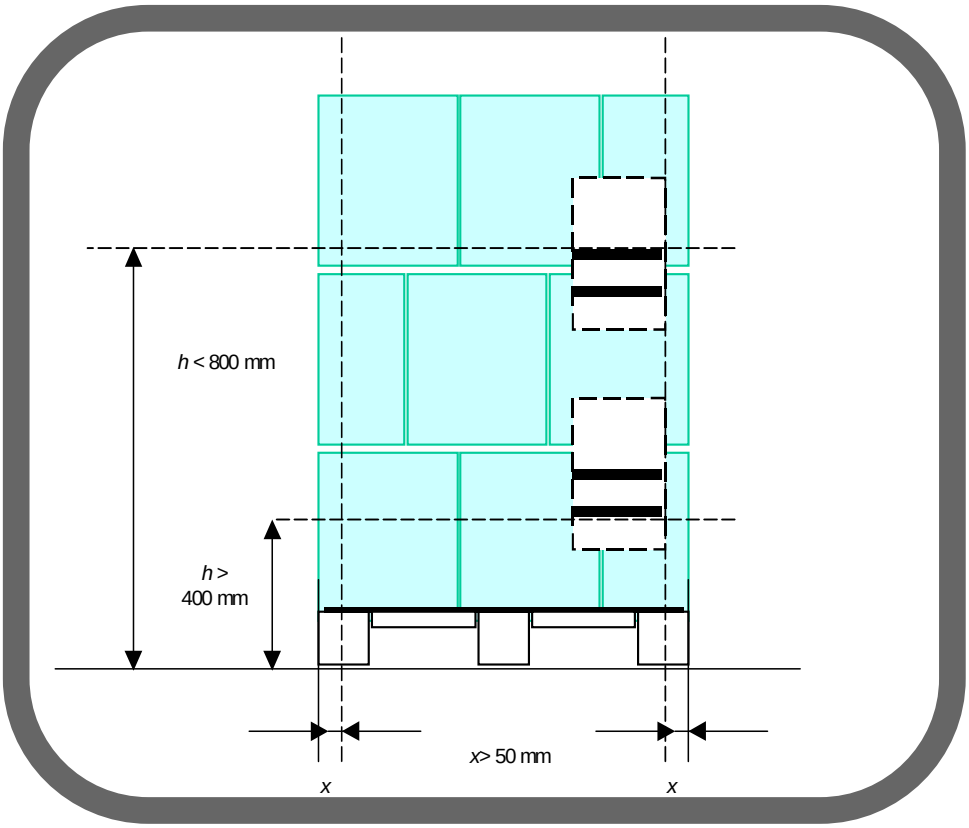
9.3.1.2 Pallets Less than 1 metre in Height

For pallets less than 1 metre in height, the logistic label should be placed as high as possible but not more than 800mm from the base of the unit.

9.3.1.3 Pallets and Other Units Greater than 1 metre in Height

For pallets and other units greater than 1 metre in height, labels should be placed so that all the bar code symbols are at a height between 400mm and 800mm from the surface on which the pallet stands and no closer than 50mm from the vertical edge.

Diagram 18: Location of the GS1 Logistics Label



10 Industry Sector Scenarios

10.1 Introduction

The basis of the GS1 System ensures that no matter what industry adopts the standards, the same methodology of allocation of numbers, choice of data carrier (bar code symbol), etc, is kept generic and thus allows for a seamless flow through the supply chain from industry to industry, trading partner to trading partner.

The Hardware Industry covers a diverse number of industry sectors all of which will follow the same standards stipulated by the GS1 System, however to assist certain sections of the Hardware Industry to clearly apply the system the following sections have been developed to provide examples of trade item and trading scenarios that are applicable within each industry sector.

To date the Hardware Industry sectors that have produced sections for this guideline are:

- Greenlife
- Timber
- Plumbing
- Electrical

Care should be taken when reading these sections to ensure that they are used in conjunction with the main body of the Hardware Guidelines. These sections only provide examples of trade item types and scenarios and **not** the methodology for how to allocate Global Trade Item Numbers (GTINs), use appropriate data carriers (bar code symbols), etc.

These sections should preferably not be distributed as standalone documents, but should this be required, to avoid any confusion, reference should be made to the entire Hardware Industry Guidelines.

It should be noted that no other industry sector is precluded from the process of developing a section in this guideline.

Please contact GS1 or the Hardware Industry Working Group for further information.

11 Greenlife Industry Scenarios

11.1 Introduction

The GS1 System prides itself on having a complete set of recommendations and requirements to ensure that all parties throughout the supply chain are aided and not hindered by the implementation of its system.

The Hardware guidelines have been written to provide a snapshot view of the GS1 System. Used in conjunction with the technical literature supplied by GS1 and assistance from GS1 they have been designed to identify the key components of the system and enable suppliers within the industry to begin implementation throughout their business.

The following section of the Hardware guidelines focuses on providing examples of trade items that exist within the Greenlife Industry and the methods of allocating Global Trade Item Numbers (GTINs). This is key foundation to implementation of other aspect of the GS1 System and the content covered in this chapter assumes some prior knowledge of GTINs and bar coding. Therefore, it is important readers of this section of the document refer to earlier chapters for reference material.

It is not feasible to include every possible variation of trade item available in such a document. It is up to suppliers to identify their own products and the associated method by which to allocate a GTIN and the respective bar code symbol applicable.

In 2002, input into this section of the Hardware Industry Guidelines was provided by the members of the Greenlife Sector group of the Hardware Industry Working Group (HIWG). Since then, any updated versions of this document have also been reviewed by the group. For more information refer to www.hiwg.org.au.

11.2 GTIN Options for Hardware Industry Trade Items

Regardless of the manner in which the trade item is sold, whether it is a packet of seeds with a standard count, or a standard weight or the selling of plants at the various sizes each variation must be assigned its own unique GTIN. For example if daisies are sold in seed packets of 50 and 100 each variation must be assigned its own unique GTIN. If these trade items are then packed into cartons of 100 and 50 respectively, these two variations also would be assigned a separate GTIN.

Note: Past applications of the GS1 standards within the Greenlife Industry have led to the application of separate GTINs for different price points rather than for each variation of trade item. GS1's recommendations are always to identify a trade item at the lowest level of variation. These guidelines will only provide examples using this methodology.

The decision of which GTIN structure and what data carrier is generally left to the discretion of each individual company and is ultimately governed by factors such as requirements within the company for the marking of additional information, the path of the trade item through the supply chain and whether the trade item will be sold in a retail Point-of-Sale environment.

11.2.1 Trade Items Sold at Retail Point-of-Sale (POS)

Trade items that are sold to a retailer for sale in the Point-of-Sale environment must be numbered and bar coded as described below. In summary the recommendations stipulate that the trade item **must** be assigned a unique GTIN using the GTIN-13 structure and represented in an EAN-13 Bar Code Symbol.

Note: All variations (different pack size, plant size, colour, plant variety etc) require a separate GTIN.

Note: Unless products are to be sold in the North American and Canadian markets companies will generally use the EAN-13 Bar Code Symbol. Please consult GS1 if your trade item is to be sold within North America and Canada.

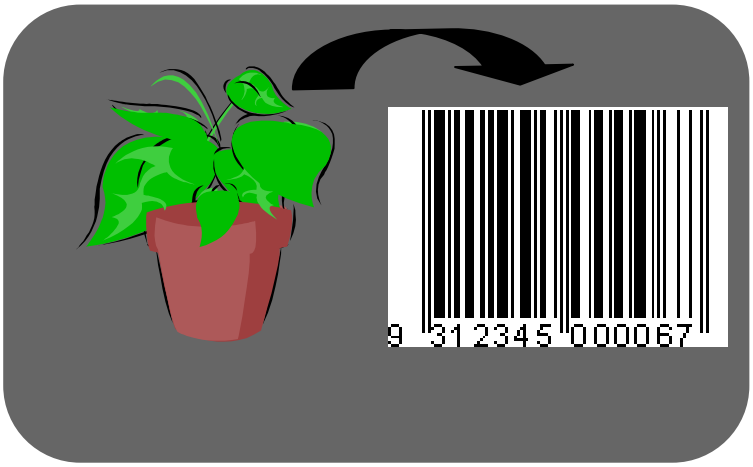
Diagram 19: Example of a packet of daisy seeds allocated a GTIN-13 represented in an EAN-13 Bar Code Symbol

The following list depicts additional examples of different trade items that would be assigned a separate GTIN for use within the Point-of-Sale environment.

- Daisy Seeds 25g
- Daisy Seeds 50g
- Beefeater Tomato Seeds 50 per Packet
- Black Russian Tomato Seeds 50 per Packet
- Premium Potting Mix 25 Litres
- Premium Potting Mix 10 Litres
- Blood and Bone 5kg
- Blood and Bone 10kg
- Loose Potting Mix $1m^3$
- Bulk Bin Potting Mix $1m^3$
- Bag $1m^3$
- etc…

Note: Listed examples in no way depict every different type of trade item available; they serve only to provide an example of product types requiring a separate GTIN.

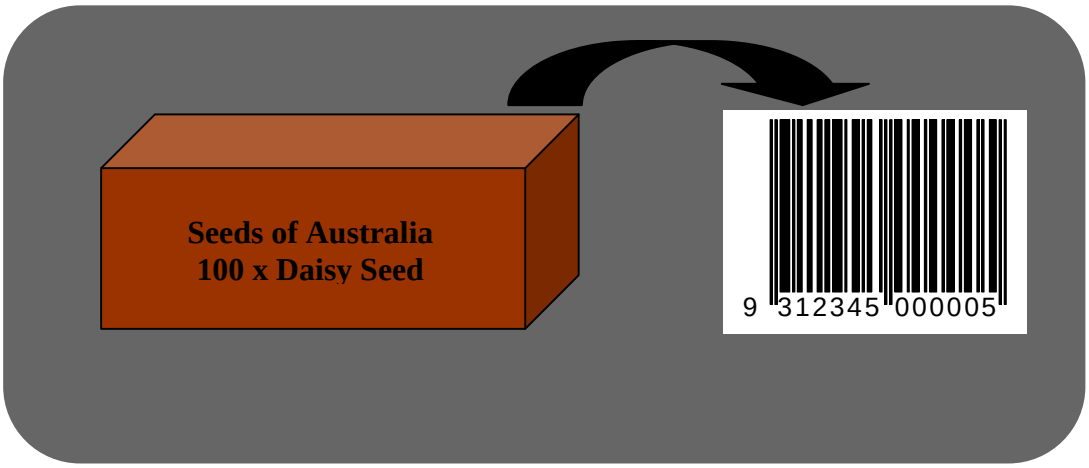
Diagram 20: Example of a potted 125mm Variety X Plant allocated a GTIN-13 represented in an EAN-13 Bar Code Symbol



The following list depicts additional examples of different trade items that would be assigned a separate GTIN for use within the point or sale environment.

- Punnet of 6 Blue Pansies
- Punnet of 6 Yellow Pansies
- 125mm Date Palm
- 200mm Maiden Hair Hanging Basket
- 125mm Maiden Hair Standard Pot
- Double Delight Bare rooted Rose
- Double Delight 125mm Pot
- etc…

Diagram 21: Example of a carton of 100 packets of daisy seeds allocated a GTIN-13 represented in an EAN-13 Bar Code Symbol



11.2.2 Trade Items NOT Sold at Retail Point-of-Sale (POS)

Where a trade item is sold at the retail Point-of-Sale (i.e. the packet of seeds), then the applicable option described in Section 11.2.1 is applicable. However if the trade item is then bundled into a stable grouping (i.e. a box of seeds) but this unit itself is **not** sold in the Point-of-Sale environment, any of the options for the numbering and bar coding described in Section 7 are applicable.

Note: Every variation (different pack size, plant size, colour, plant variety etc) requires a separate GTIN. If the variations vary for every different order a Variable Measure GTIN should be assigned, see Section 7.3 and 11.2.3 for further information.

Diagram 22: Example of a carton of seeds allocated a GTIN-13 with a leading zero represented in a GS1-128 Bar Code Symbol

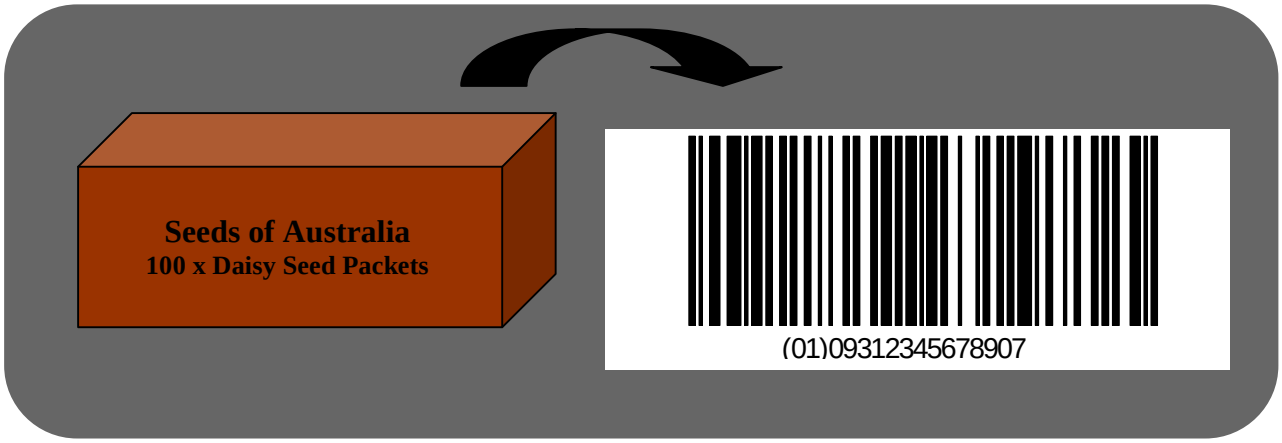
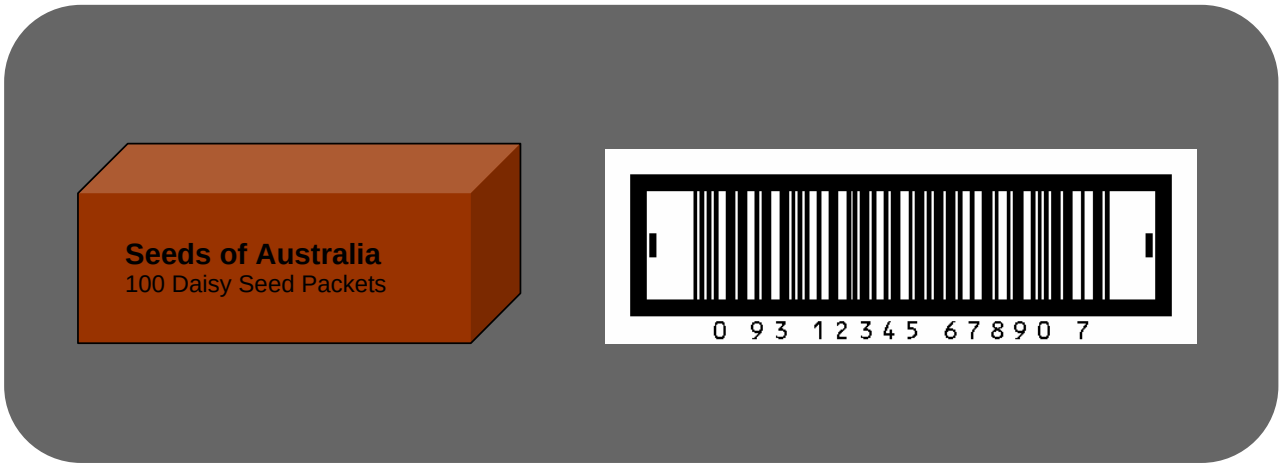


Diagram 23: Example of a carton of seeds allocated a GTIN-13 with a leading zero represented in an ITF-14 Bar Code Symbol



Note: In the examples presented in Diagram 22 and

Diagram 23 the GTIN assigned must be unique and hence **must not** be the same as the GTIN assigned to the individual piece.

ALTERNATIVE OPTION

Alternatively the GTIN-14 option could have been used, see example below.

Diagram 24: Example of a tray of 128 potted 50cm Variety X Plant allocated a GTIN-14 represented in a GS1-128 Bar Code Symbol

OR

Diagram 25: Example of a tray of 128 Potted 50cm Variety X Plant allocated a GTIN-14 represented in an ITF-14 Bar Code Symbol

The following list depicts additional examples of different trade items (not sold at retail POS) that should be assigned a separate GTIN.

- Tray of 512 Punnets of Blue Pansies
- Tray of 512 Punnets of Yellow Pansies
- Carton containing 100 Sleeves of Daisy Seeds
- Carton containing 200 Sleeves of Daisy Seeds
- etc….

11.2.3 Variable Measure Trade Items NOT Sold at Retail Point-of-Sale (POS)

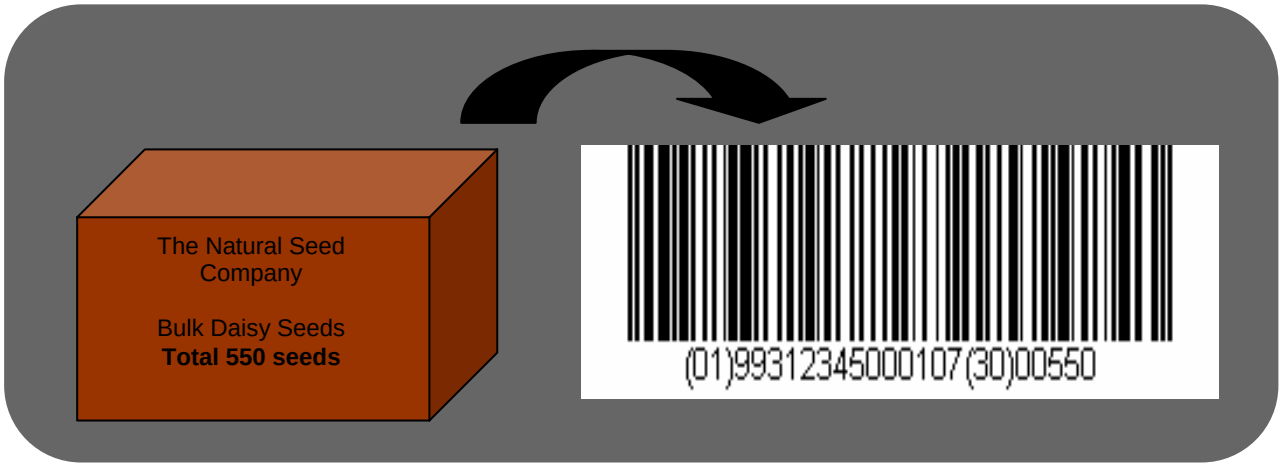
As described in Section 7.3 trade items may be variable measure either because the production process does not guarantee consistency in weight, size or length etc, or because the items are created to meet a special order which states a quantity (e.g. seeds sold by count).

The use of a variable measure GTIN enables the identification of the variable piece of data to be included within the bar code symbol.

Within the Greenlife Industry certain trade items fall within the above mentioned definition. These include seeds sold by count, seeds sold by weight, etc.

Note: This solution will not be available for trade items that are sold through a traditional retail Point-of-Sale environment as POS scanners are not set up to scan the GS1-128 Bar Code Symbol required for this application.

Diagram 26: Bulk Seeds sold by count



In this example the number of seeds ordered was 550.

The example provided above highlights the need for a variable measure trade item based on the number or count of seeds. It is assumed that Bulk Daisy Seeds are never sold in a standard count/quantity. In the event that the seed will always be sold in a standard quantity a standard GTIN must be assigned to every different standard quantity available, be it 500,1,000 and so on.

If a trade item can be sold in different units of measure, for example variable count or sold by weight, each variation should be assigned a separate GTIN.

Example

Diagram 27: Bulk Seeds Sold by the weight, total weight for this example 3.25kg

Note: A separate variable measure GTIN has been assigned to identify Bulk Seeds sold by the weight and Bulk Seeds sold by the count.

Other trade items may be sold in variable quantities determined by the trading partner. Such products may include, bulk potting mix, sand, pebbles, gravel etc. The following example depicts the identification of Bulk Potting Mix Grade A as a variable measure trade item.

Diagram 28: 16m3 of Bulk Potting Mix Grade A identified with a Variable Measure GTIN

In this example it is assumed that the number of cubic metres provided varies from load to load and hence the use of the variable measure GTIN is applicable. In the event that the Bulk Potting Mix can be purchased in a standard amount, for example 15 cubic metres, then the allocation of a separate standard GTIN applies.

Note: Current trading practices do not trade loose material such as Bulk Potting Mix, Sand, and Pebbles etc in variable quantities. However the example provided above serves to demonstrate the most suitable method of dealing with such product should there be a requirement to manage variable quantities in the future.

11.3 Attribute Information Options for the Greenlife Industry

In “principle” the Australasian Hardware Industry supports the use of variable data in the long term. Individual companies need to make their own assessment on the implementation and use of variable data in their business.

Suppliers may wish to enhance the traceability of their own products by introducing additional information over and above the allocation of a GTIN to each trade item.

When attribute information is applied to a trade item that is sold at POS then it can be added along side the EAN-13 Bar Code Symbol, (see below) or encoded in a GS1 DataBar Bar Code Symbol if the systems that will record the scanning of the item and the resulting GTIN are suitably enabled. Detailed information about GS1 DataBar can be found in Section 6.3.

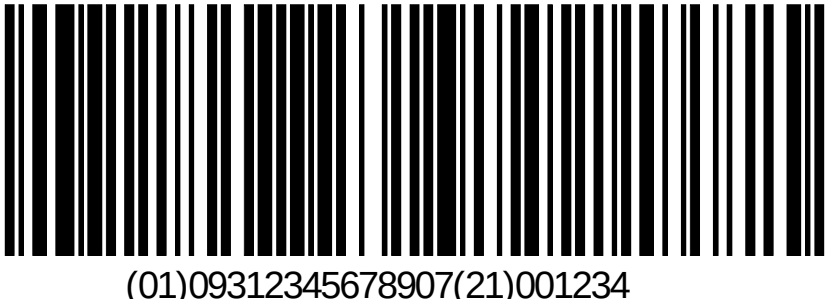
Where the trade item will not be sold at the retail POS attribute information can be concatenated (linked together) with the GTIN, in one single GS1-128 Bar Code Symbol as shown in Figure 14: Concatenated GS1-128 Bar Code Symbol or in a GS1 DataBar Bar Code Symbol.

For further information regarding Attribute Information please refer to Section 6.2

Figure 13: GTIN and serial number represented in separate bar code symbols

Note: The attribute information, in this example serial number, represented in the above figure will NOT scan at the Point-of-Sale. Only the EAN-13 will scan.

Figure 14: Concatenated GS1-128 Bar Code Symbol



Note: The bar code symbol represented in the above figure will not scan at the Point-of-Sale

Note: The following section describes some of the Application identifiers that the Greenlife Industry sees as providing useful additional information. This does not preclude suppliers from accessing the entire list of AIs available for use.

11.3.1 Batch Numbers

The Application Identifier (10) is used to define a batch number.

Up to twenty alphabetic and/or numeric characters can be assigned not including the AI. Examples of information that can be included with the AI (10) are:

- production line numbers
- shift numbers
- time of production

A company other than the one creating the number need not use any internal structures encoded into a batch number. Other companies must use the complete number to identify the batch unambiguously. This is particularly important in situations such as product recall.

Note: The AI 10 must be associated with a GTIN or with the combined AIs 02 and 37

Figure 15: Batch Number (AI 10) represented in a GS1-128 Bar Code Symbol

(10)246813

Diagram 29: Customised Potting Mix marked with a GTIN, Use By Date and batch number.

Note: If the bags illustrated above were intended for retail sale the information shown could be encoded in a GS1 DataBar Bar Code Symbol, provided the scanners at the POS were suitably enabled.

11.4 Logistic Unit Marking for the Greenlife Industry

The identification of standard and variable measure trade items is achieved by the allocation of unique GTINs. The natural progression from the identification of a trade item is to the identification of a logistic unit.

As described in Section 8 a logistic unit is an item of any composition established for transport and/or storage, which needs to be managed through the supply chain.

The use of the SSCC can enable the unique identification of every logistic unit. Within the Greenlife sector this includes the identification of truckloads of sand, bulk loads of potting mix, pallets of cartons of seed, etc.

There are also instances within the Greenlife Industry where the allocation of a GTIN is not feasible because the resulting permutations and combination of product are limitless and are generally governed by the customer's order or orders.

Seedlings fall into this category. With customers able to pick and choose what is required within their order the allocation of a GTIN for each combination is unrealistic. With the use of scan packing, the solution for the marking of such a logistic unit is with the Serial Shipping Container Code (SSCC) as described in Section 8

Example:

The following example depicts the identification of a trolley of plants ordered by a customer. The trolley is made up of 10 trays of pansies with each tray made up of 8 punnets. In this example each tray consists of the same variety of pansy but there is a mix of trays in the trolley. Overall the trolley consists of:

- 2 Trays of Blue Pansies
- 3 Trays of Red Pansies
- 4 Trays of Purple Pansies
- 1 Tray of Yellow Pansies

Note: Each of the variations of trays and punnets has its own unique GTIN.

Diagram 30: GTINs assigned to individual punnets of Pansies

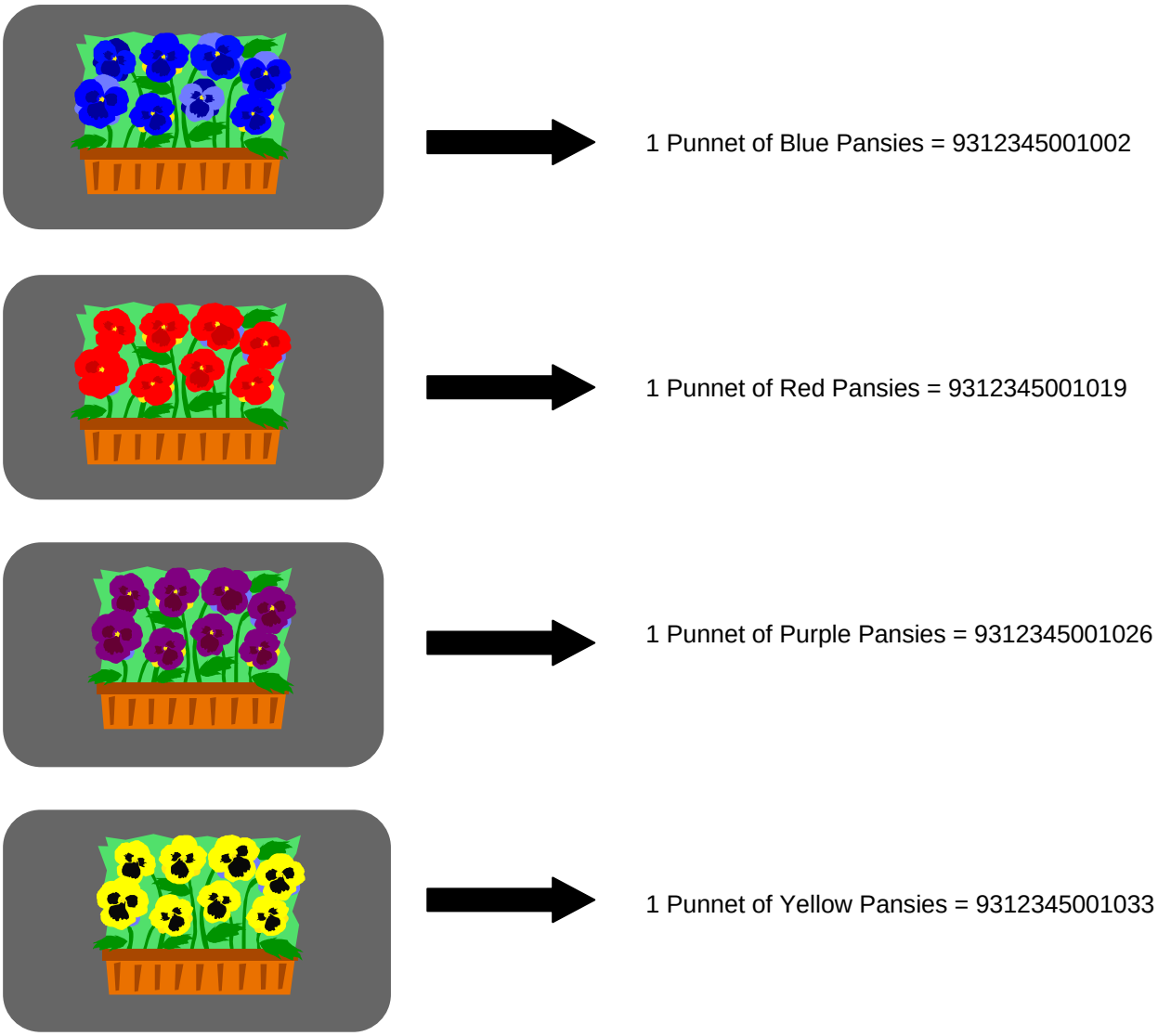


Diagram 31: GTINs assigned to trays of Punnets of Pansies

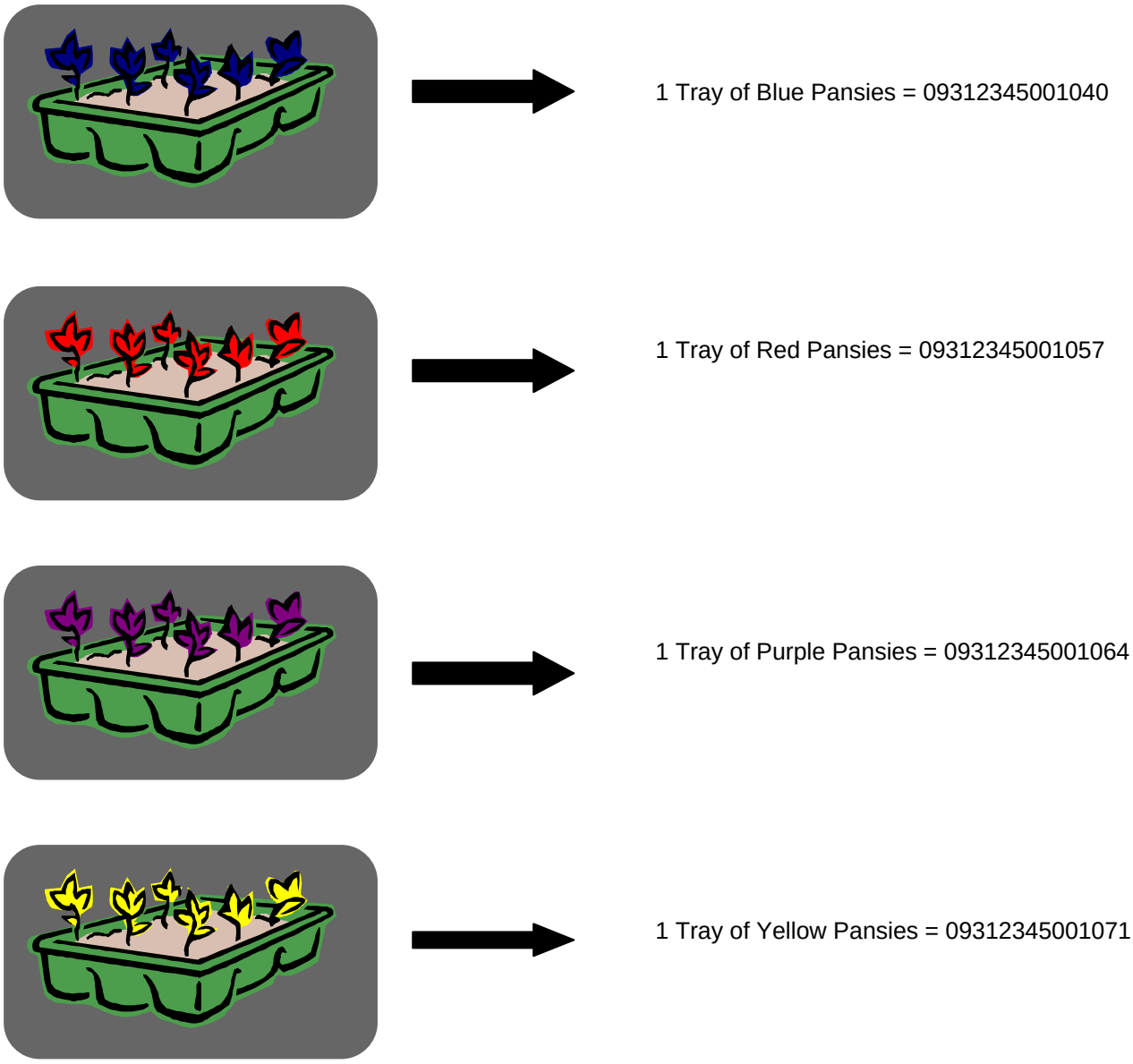


Diagram 32: Logistic Unit (Trolley) of Pansies or a pallet of Potting Mix

Note: The SSCC would be represented on a label with a format depicted in Section 8.3

11.5 Greenlife Industry Implementation Issues

The implementation process often identifies anomalies that exist with certain product types where the standard application of the GS1 System is either not feasible or not practical. This in no way indicates that the system is not used; it merely indicates that standard methodologies currently available do not fit within the scope of that particular product.

For instance the application of GTINs to bulk potting mix is practical and feasible; however the physical application of the GTIN represented by the relevant bar code symbol to the actual unit itself may not be realistic or practical.

This section has been developed to assist the industry identify these trade items and methods of dealing with these trade items through the supply chain, including final retail Point-of-Sale.

11.5.1 Bulk Potting Mix and Loose Materials

Loose materials such as Bulk Potting Mix are generally delivered in any of the following ways:

- Truck Loads
- Containers, e.g. Wooden Bins
- Bulk Bags

The physical application of the bar code symbol to such trade items may present a problem since the load is generally not secured with any physical packaging the application of a physical label to the trade item is not likely to be feasible. In this instance trading partners may agree to supply the label on documentation provided with the delivery.

Alternatives to this solution include providing a secure plastic pocket attached to the container that is protected from the elements. Within this pocket the label can be secured.

For further information regarding placement of labels on bulk trade items please consult GS1.

11.5.2 Variable Measure Trade Items Sold at Retail Point-of-Sale (POS)

It has been identified within the Greenlife Industry that some trade items sold to trading partners begin as standard items allocated a standard GTIN. For example, bulk potting mix, sand, gravel, pebbles etc.

These trade items can then be sold to the consumer in any number of variations of volume generally dictated by the consumer at the point of purchase. The following possible solutions are available to trading partners to enable the automation of the trade item, (generally required at the retail Point-of-Sale).

1. The supplier allocates (but does not mark the trade item) with a standard GTIN that identifies the trade item as **"Sandpit Sand variable measure"**. The cost for each cubic metre of the trade item would be entered into the database; much like the cost of a standard trade item is linked to the GTIN of a product. This assigned GTIN is represented by an EAN-13 Bar Code Symbol and printed in what is commonly called a shadow book[13] with an appropriate description along side.

[13] A Shadow book is a book that contains the printed form of any GTINs assigned but not printed on the actual trade item, generally because it is not physically possible to do so. The shadow book provides the operator the ability to quickly reference

At the point of purchase the operator would scan the appropriate GTIN and the system would need to be programmed to prompt the operator for the total volume in cubic metres purchased. From here the system calculates the price accordingly and registers the sale.

2. The alternative to the above solution is that the seller (normally a retailer) of the trade item assigns restricted use GTIN instead of the supplier and follows the same procedure as described above. Please consult the technical literature supplied by GS1 or contact GS1 for further information on restricted use GTINs.

11.5.3 Customised Potting Mix

Customers have the option of ordering potting mix customised to their liking, i.e. the 'recipe' within the mix varies from customer to customer and often from order to order. Where there is never a consistent 'recipe' of potting mix the only method to identify such an order is with the use of the SSCC, refer to Section 8 for further information.

Alternatively where there is always a standard "recipe" that can be purchased each variation can be assigned a unique GTIN. In the event a new recipe is devised then companies may choose to assign a new GTIN should this recipe become a regularly orderable trade item.

11.5.4 Grouped Items NOT Sold as a Trade Item

In some instances trade items are bundled together for transportation purposes but are not traded in this form. Bare rooted plants are such an example. These trade items are only sold as individual units, however to increase stability during the transportation process they are bundled together in groups. Currently there are no requirements for the numbering and bar coding of these types of grouped items.

Note: Should companies wish to number and bar code symbol these items this is perfectly acceptable.

11.5.5 Mixed Trays of Seedlings

In some instances companies may wish to trade trays of seedlings that contain a variation in colour of the same plant. There are a number of ways to assign a GTIN to this configuration of product dependent on the requirements between trading partners.

- **Where the combination of seedlings is always the same**

  In the instances where a supplier provides a standard combination of different coloured seedlings. For example a tray that consists always of 6 Blue Pansies, 6 Yellow Pansies, 6 Purple Pansies and 6 White Pansies, then a GTIN can be assigned to this standard combination. Refer to Section 11.2 for GTIN options.

  Any order of this GTIN will result in the stated combination being provided. For any other standard combination a separate unique GTIN will be required.

- **Where the combination of seedlings varies from tray to tray and this information does not need to be conveyed**

  Where there is never a set combination of plants within a tray and the trading partner does not require the knowledge of the final combination of trade items one GTIN can be assigned to identify that the trade item is a mixed tray of Pansies configuration unknown. Refer to Section 11.2 for GTIN options.

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trade items sold and scans the appropriate bar code symbol. It provides an automated solution for the trade items not easily bar coded or have a variable component dictated by the customer.

In this instance trading partners will not be able to track the specific combinations of colours that may be included within the tray.

- **Where the combination of seedlings varies from tray to tray and this information does need to be conveyed**

  Where there is never a set combination of plants within a tray and the combination is required to be advised then the SSCC should be used. This would result in information pertaining to each plant being linked to the SSCC and transmitted via Electronic Data Interchange (EDI) prior to the despatch of the order. Refer to Section 8 and 11.4.

12 Timber Industry Scenarios

12.1 Introduction

The GS1 System prides itself on having a complete set of recommendations and requirements to ensure that all parties throughout the supply chain are aided and not hindered by the implementation of its system.

The Hardware guidelines have been written to provide a snapshot view of the GS1 standards. Used in conjunction with the technical literature supplied by GS1 and assistance from GS1 Australia they have been designed to identify the key components of the system and enable suppliers within the industry to begin implementation throughout their business.

The following section of the Hardware guidelines focuses on providing examples of trade items that exist within the Timber Industry and the methods of allocating GTINs for trade item identification. This is key foundation to implementation of other aspect of the GS1 System and the content covered in this chapter assumes some prior knowledge of GTINs and bar coding. Therefore, it is important readers of this section of the document refer to earlier chapters for reference material.

It should also be noted that it is not feasible to include every possible variation of trade item available in such a document. It is up to suppliers to identify their own products and the associated method by which to allocate a GTIN and the respective bar code symbol type to use.

In 2002, input into this section of the Hardware Industry Guidelines was provided by the members of the Timber Sector group of the Hardware Industry Working Group (HIWG). Since then, any updated versions of this document have also been reviewed by the group. For a list of current Timber Sector group members, please refer to the HIWG website at www.hiwg.org.au.

The range of trade items covered by the Timber Sector group includes structural timber, timber boards and lining, treated timber, roundwood, timber mouldings, engineered timber, plywood, MDF and particleboard panels, and MDF mouldings. In this document, representative timber and panel products have been chosen for the purposes of illustrating the principles involved.

The main focus of the Timber Sector group is on the business transactions supporting the sale of timber by the manufacturer. Most of the goods are sold in a packaging unit referred to as a ‘pack’. The customer either on-sells the product in the same packaging unit, or breaks open the pack and sells individual pieces (which may be repackaged). Assignment of GTINs to the individual pieces is also important, as retailers require this for POS purposes.

12.2 Terminology and Definitions for Timber Trade Items

To ensure consistency and an understanding of the Timber Industry terminology the following section seeks to clearly describe the terminologies intended for use throughout this section of the Hardware Guidelines relating to Timber trade items.

In this section the term **timber** is used when referring to timber products that exist physically as lengths of timber.

12.2.1 Timber Terminology

12.2.1.1 Packaging Level

Packaging level is defined as the level at which the trade item is packaged for sale i.e. whether it is sold as pieces, packs or bulk, and if sold as packs, the size of the packs.

12.2.1.2 Pack Configuration

The pack configuration is defined as whether the trade items are sold as a set length pack, random length pack or a cut to length pack. These commonly used terms are defined in section 12.2.2.

12.2.1.3 Pack Type

Whether a trade item is a full pack, half pack etc. For timber, it is normally the end section that determines how many pieces will be in a given pack at a given mill, how many pieces across the base of the pack and how many pieces high. The normal sized pack produced by a timber mill may be referred to as having a pack type of full pack. The same mill might also produce the same product in other pack types such as half pack and jumbo pack. Each of these pack types represents a different packaging level

12.2.1.4 Pack Tally

The pack tally is a record of the number of pieces in a pack of timber and their dimensions.

12.2.1.5 Pack Size

The pack size is the number of pieces in a pack.

12.2.1.6 Piece Length

The length of an individual piece of timber, alternatively described as a length of timber. When the trade item is a pack of timber this attribute refers to the length of each individual piece in the pack. (This is only relevant if all pieces in the pack have the same piece length).

12.2.2 Timber Configurations

Various timber configurations relating to the way in which timber is packaged and defined for sale are reviewed in this document and these are defined below:

12.2.2.1 Standard Set Length Pack

A standard set length pack is a pack of timber containing a selection of pieces of timber, all having the same end section and length. Length is normally a 'nominal length' in 300 mm increments from 300 mm to 7200 mm.

For standard set length pack trade items, both piece length and pack size (number of pieces in a pack) are pre-defined by the GTIN and thus allows for the allocation of a fixed measure GTIN. This can require the allocation of a separate GTIN for each mill where the standard pack size varies from mill to mill within a business.

12.2.2.2 Variable Set Length Pack

Variable set length pack trade items are set length pack items where the pack size varies from pack to pack. These should only be used for the situation where some packs are produced slightly under or over the standard number of pieces in a pack due to end-of-run processes in some mills. These trade items will not be orderable.

12.2.2.3 Variable Cut to Length (CTL) Pack

This pack type is the same as a set length pack except that piece length is not pre-defined by the GTIN, but is specified at the time of ordering. This is only used for uncommon lengths that have not had a GTIN assigned for the specific length.

Normally the number of pieces in a variable CTL pack will correspond to the number in a set length pack of the same end section from the same mill. However, the same variable GTIN can be used to span multiple pack size, because the volume of CTL products sold is very small.

12.2.2.4 Random Length Pack

A random length pack is a pack of timber containing a selection of pieces of timber all of the same end section, but varying in length, with the mix of lengths varying from pack to pack. These are assigned a variable measure GTIN.

Random length packs can be classified as 'Long, 'Medium" or 'Short', determined by the piece length range in a pack. Where this is significant for trading purposes, a separate GTIN should be issued for each of these.

12.2.2.5 Standard Mixed Length Pack

Standard mixed length pack refers to a pack similar to a random pack with a selection of timber all of the same end section and varying in length, with the difference that the mix of lengths is standard from pack to pack.

12.2.2.6 Bulk

It may be appropriate to regard some timber trade items as bulk product where packaging is irrelevant. These items require a variable measure GTIN. This approach might be used for certain lower grade product and bulk export of timber.

12.2.2.7 Standard Length Piece

The manufacturer sells most timber in packs. However, the individual pieces of timber in the packs also require identification, for retail sale purposes. Standard length piece trade items have predefined length.

12.2.2.8 Variable Length Piece

Timber pieces may be 'cut to length' for sale, a variable measure GTIN is required to identify these items.

12.3 GTIN Options for Timber Trade Items

In Section 7 the methods for allocating and representing GTINs is described in detail and should be referred to when reviewing the following scenarios.

Specifying a particular GTIN for a trade item such as structural timber should normally identify the item in terms of the following attributes or characteristics:

- Species
- Condition/Dryness
- Finish
- End-Section
- Pack Configuration
- Piece Length
- Origin
- Grade
- Treatment
- Profile
- Packaging Level
- Pack Type
- Brand
- Value-Added

Timber is produced in many different pack sizes and lengths. Because of the significant variation in these two attributes, there has been a tendency to define timber trade items at a level that does not define these attributes closely enough to allow for fixed measure trade items.

However, the overriding principle adopted in the following examples is that the attributes of packaging level and piece length should be predefined by the GTIN – thus enabling the assignment of a fixed measure GTIN and removing the need for individual pack tallies where possible. Only if there is significant variation in one or the other of these attributes, making it impractical to assign a GTIN for each variant, is a variable measure GTIN that spans multiple variations allowed.

The decision of which GTIN structure and what data carrier is generally left to the discretion of each individual company and is ultimately governed by factors such as requirements within the company for the marking of additional information, the path of the trade item through the supply chain and whether the trade item will be sold in the retail Point-of-Sale environment.

12.3.1 Trade Items Sold at Retail Point-of-Sale (POS)

Trade items that are sold to a retailer for sale in the Point-of-Sale environment must be numbered and bar coded as described below. In summary the recommendations stipulate that the trade item **must** be assigned a unique GTIN using the GTIN-13 structure and usually represented in an EAN-13 Bar Code Symbol, although GTIN-14 encoded in GS1-DataBar Bar Code Symbol is an option, where the scanners and computer systems at the POS are suitably enabled.

Note: All variations require a separate GTIN.

Note: Unless products are to be sold in the North America and Canada, companies will generally use the EAN-13 Bar Code Symbol. Please consult GS1 if your trade item is to be sold within North America or Canada. When dealing with any country you should only consider using GS1 DataBar when you know that any retail system that will scan the item is enabled for GS1 DataBar.

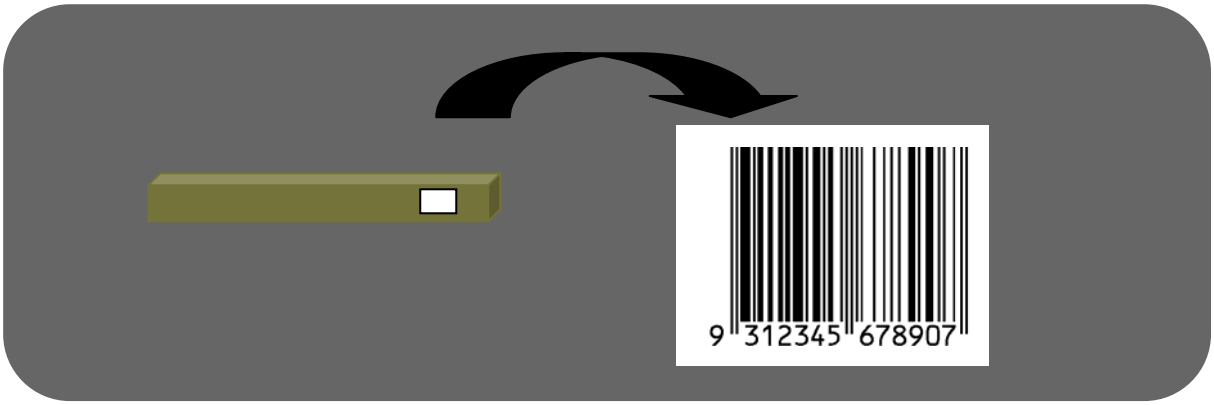
Within the Timber Industry the following configurations may fall within the category of a trade item sold at retail Point-of-Sale (POS) and thus must be numbered and bar coded according to the methods described in this section:

- Standard Set Length Pack see Section 12.2.2.1 for full definition
- Standard Mixed Length Pack see Section 12.2.2.5 for full definition
- Standard Length Piece see Section 12.2.2.7 for full definition

In Section 12.4 the Timber Sector group has defined specific recommendations pertaining to the allocation and use of GTINs. The recommendations applicable for Timber Trade Items sold at retail Point-of-Sale are 1, 2, 3, 4, 5, 6A and 7A.

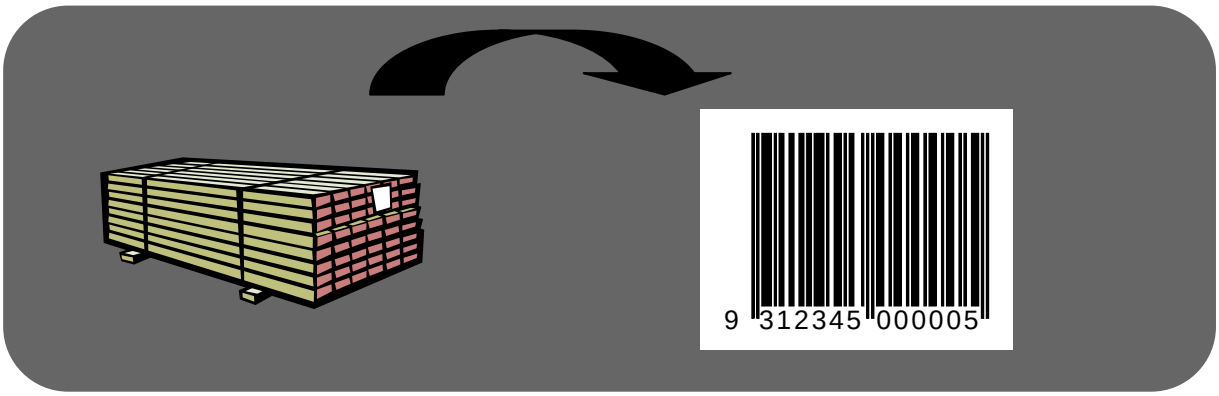
Example:

Diagram 33: Example of a piece of timber allocated a GTIN-13 represented in an EAN-13 Bar Code Symbol



Example:

Diagram 34: Example of a standard set length pack of timber allocated a GTIN-13 represented in an EAN-13 Bar Code Symbol



12.3.2 Fixed Measure Trade Items NOT Sold at Retail Point-of-Sale (POS)

Where a trade item is sold at the retail Point-of-Sale (i.e. pack or piece of timber), then the applicable option described in Section 12.3.1 is applicable. However if the trade item is **not** sold in the Point-of-Sale environment, any of the options for the numbering and bar coding described in Section 7.2 are applicable.

Within the Timber Industry the following configurations may fall within the category of a trade item not sold at retail Point-of-Sale (POS) and thus must be numbered and bar coded according to the methods described in this section:

- Standard Set Length Pack see Section 12.2.2.1 for full definition
- Standard Mixed Length Pack see Section 12.2.2.5 for full definition
- Standard Length Piece see Section 12.2.2.7 for full definition

In Section 12.4 the Timber Sector group has defined specific recommendations pertaining to the allocation and use of GTINs. The recommendations applicable for Timber Trade Items **not** sold at retail Point-of-Sale are 1, 2, 3, 4, 6A, 7A and 9.

Example:

Diagram 35: Example of a standard set length pack of timber allocated a GTIN-13 with a leading zero represented in a GS1-128 Bar Code Symbol

Alternatively a standard set length pack of timber may be allocated a GTIN-13 with a leading zero and have this represented in an ITF-14 Bar Code Symbol. Due to the industry practice of identifying timber packs with a serial number as well as a GTIN, this however would not typically be used.

Note: In the examples presented in Diagram 35 the**Error! Reference source not found.** GTIN assigned must be unique and hence **must not** be the same as the GTIN assigned to the individual piece

ALTERNATIVE OPTION

Alternatively the GTIN-14 option could have been used, see example below.

Diagram 36: Example of a standard set length pack of timber allocated a GTIN-14 represented in a GS1-128 Bar Code Symbol

Alternatively a standard set length pack of timber may be allocated a GTIN-14 using the indicator method, and have this represented in an ITF-14 Bar Code Symbol. Due to the industry practice of identifying timber packs with a serial number as well as a GTIN, this however would not typically be used.

12.3.3 Variable Measure Trade Items NOT Sold at Retail Point-of-Sale (POS)

As described in Section 7.3 trade items may be variable measure either because the production process does not guarantee consistency in weight, size or length etc. or because the items are created to meet a special order which states a quantity or measure (e.g. timber ordered in a certain piece length). The HIWG recommendations document 'Bar Coding of Timber Packs v1.1' provides further information about identification and bar coding of variable measure trade items not sold at retail POS.

The use of a variable measure GTIN enables the identification of the variable piece of data to be included within the bar code symbol.

Note: This solution will not generally be available for trade items that are sold through a traditional retail Point-of-Sale environment as POS scanners are not set up to scan the GS1-128 Bar Code Symbol required for this application. However, where a retailer has enabled scanners and systems at the POS to scan GS1 DataBar Bar Code Symbols, these bar code symbols may be used in preference to GS1-128 Bar Code Symbols.

Within the Timber Industry the following configurations fall within the category of a variable measure trade item **not** sold at retail Point-of-Sale (POS) and thus must be numbered and bar coded according to the methods described in this section:

- Variable Set Length Pack see Section 12.2.2.2for full definition
- Random Length Pack see Section 12.2.2.4 for full definition
- Variable Cut to Length Pack see Section 12.2.2.3 for full definition
- Variable Length Piece see Section 12.2.2.8 for full definition
- Bulk see Section 12.2.2.6 for full definition

Note: Discussion between trading partners should determine if there is a physical requirement to label each variable length piece with its respective GTIN and bar code symbol.

In Section 12.4 the Timber Sector group has defined specific recommendations pertaining to the allocation and use of GTINs. The recommendations applicable for Variable Measure Timber Trade Items not sold at retail Point-of-Sale are 6B, 7B and 8.

Example:

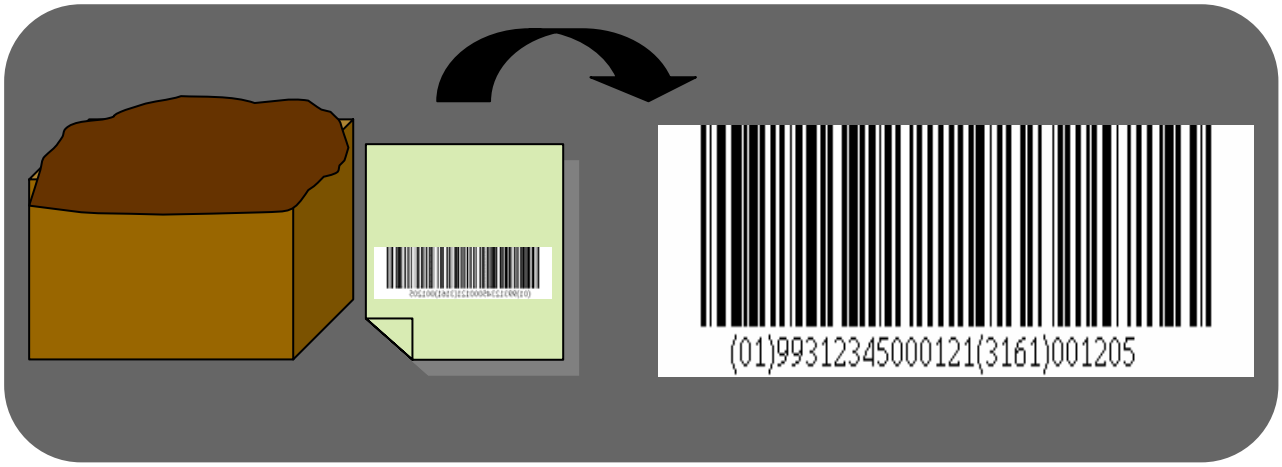
Diagram 37: Example of a variable measure pack of timber represented by a Variable Measure GTIN with the associated length measurement represented in a GS1-128 Bar Code Symbol

In this example the total length of timber contained within the pack is 1288.2 metres.

Note: The solution illustrated does **not** permit the marking of this type of timber pack for sale at the retail Point-of-Sale if systems are not enabled to scan the GS1-128 Bar Code Symbology. If required for use at the retail Point-of-Sale a GS1 DataBar Bar Code Symbol could be used provided the scanning and computer systems involved are enabled.

Variable Measure GTINs can also be used for the identification of trade items sold in bulk such as wood chips

Diagram 38: Delivery docket or invoice for 120.5m^3 of Pine Wood Chips identified with a Variable Measure GTIN. The docket or invoice can be used at the time of receiving.



The example provided above defines that the Pine Wood Chips are never sold as a fixed measure trade item. It is assumed that the number of cubic metres provided varies from load to load and hence the use of the variable measure GTIN is applicable. In the event that the Pine Wood Chips can be purchased in a standard amount then the allocation of a separate standard GTIN applies.

12.4 Timber Trade Item Recommendations

The following summarises the recommendations suggested for the implementation of the GS1 standards for timber trade items. The recommendations focus mainly on the allocation of GTINs to trade items and the suggested allocations at both piece and pack level, fixed and variable measure trade items. Refer to Section 12.3 for examples of some of the following recommendations.

Table 4: Timber Trade Item recommendations

Recommendation Number[14]	Recommendation Statement
1	A GTIN is assigned to each packaging level.
2	For pack trade items, the GTIN should predefine the pack size – unless this is impractical due to the multiplicity of pack sizes possible.
3	For timber trade items with a single definable piece length, the GTIN should predefine the piece length – unless this is impractical due to the multiplicity of piece lengths possible.
4	When ordering timber, customers should order using the GTIN that most fully defines the item, rather than using other less specific variable measure GTINs that might span multiple lengths or pack sizes.
5	For timber piece trade items, a unique fixed measure GTIN, in a bar code symbol scannable at POS, should be assigned for each piece length.
6A	Set length packs should be assigned a unique fixed measure GTIN for each piece length/pack size combination. This may require a separate fixed measure GTIN per production mill where the standard pack size varies by mill within a business.
6B	A separate variable measure (length specific) GTIN can be assigned to any occasional set length packs that may be produced that are under or over the standard pack size for the production mill.
7A	Cut to length packs should be assigned a unique fixed measure GTIN for each piece length/pack size combination that is commonly produced and sold. Normally this will require a separate fixed measure GTIN per production mill as standard pack size varies by mill.
7B	A separate variable measure GTIN can be used for one-off lengths in any pack size.
8	Items sold in random lengths packs (with inherent variability in pack size) should be assigned a variable measure GTIN.
9	The choice of which type of GTIN to use for fixed measure non-retail trade items (GTIN-13, GTIN-13 with filler zero or GTIN-14 with indicator between 1 and 8) is at the discretion of the supplier. However, a GTIN-13 encoded in an EAN-13 Bar Code Symbol is normally required for retail Point-of-Sale.

[14] The recommendation numbers listed can be referenced in the "Identification of Timber with the GS1 Numbering Standard-Product Variability Considerations Version 1.0", which can be downloaded from www.hiwg.org.au.

12.5 Terminology and Definitions for Panel Trade Items

To ensure consistency and an understanding of the Timber Industry terminology the following section seeks to clearly describe the terminologies intended for use throughout this section of the Hardware Guidelines relating to Panel trade items.

The term **panel** is used for products that exist as sheets, such as particleboard, MDF panel, or ply wood.

12.5.1 Panel Terminology

12.5.1.1 Piece Size

The width and length of an individual piece or sheet of a panel trade item. When the trade item is a pack of panels this attribute refers to the width and length of each individual piece in the pack

12.5.2 Panel Configurations

The main configurations in which panels are sold are as follows:

12.5.2.1 Standard Pack

A standard pack is a pack of panels containing a selection of panels all having the same width and length and a consistent number of pieces within a pack.

12.5.2.2 Variable Cut to Size Pack

A variable cut to size pack is a pack of panels containing a selection of panels all having the same width and length where the customer defines the size of the panels on the order for uncommon ‘cut to size’ requests. Again the number of pieces in a pack remains consistent.

12.5.2.3 Standard Piece

A standard piece trade item is a panel trade item of a predefined piece size.

12.5.2.4 Bulk

It may be appropriate to regard some panel trade items as bulk product where packaging is irrelevant. These items require a variable measure GTIN. This approach might be used for certain lower grade product, bulk export of timber and for uncommon ‘cut to size’ requests.

12.6 GTIN Options for Panel Trade Items

In Section 7 the methods for allocating and representing GTINs is described in detail and should be referred to when reviewing the following scenarios.

The definition of timber and panel trade items has many similarities. The main differences between panels and timber include:

- Panels are sold as sheets rather than lengths
- Panels within a pack are all of the same size
- Panels tend to be sold in packs of fixed pack size by supplier (within the domestic market)

The allocation of a GTIN to panels should identify the trade item in terms of the following characteristics:

- Substrate
- Finish
- Packaging Level
- Value-Added
- Piece Size (Width by Length)
- Colour
- Treatment
- Profile
- Piece Thickness
- Pack Type
- Brand

The attributes of particular interest within the area of panels are packaging level and piece size as panels can be produced in many different packaging levels and sizes, though panels have less variation than timber.

The decision of which GTIN structure and what data carrier is generally left to the discretion of each individual company and is ultimately governed by factors such as requirements within the company for the marking of additional information, the path of the trade item through the supply chain and whether the trade item will be sold in the retail Point-of-Sale environment.

12.6.1 Trade Items Sold at Retail Point-of-Sale (POS)

Trade items that are sold to a retailer for sale in the Point-of-Sale environment must be numbered and bar coded as described below. In summary the recommendations stipulate that the trade item **must** be assigned unique GTIN using the GTIN-13 structure and represented in an EAN-13 Bar Code Symbol.

Note: All variations require a separate GTIN.

Note: Unless products are to be sold in North America and Canada, companies will generally use the EAN-13 Bar Code Symbol. Please consult GS1 if your trade item is to be sold within North America and Canada.

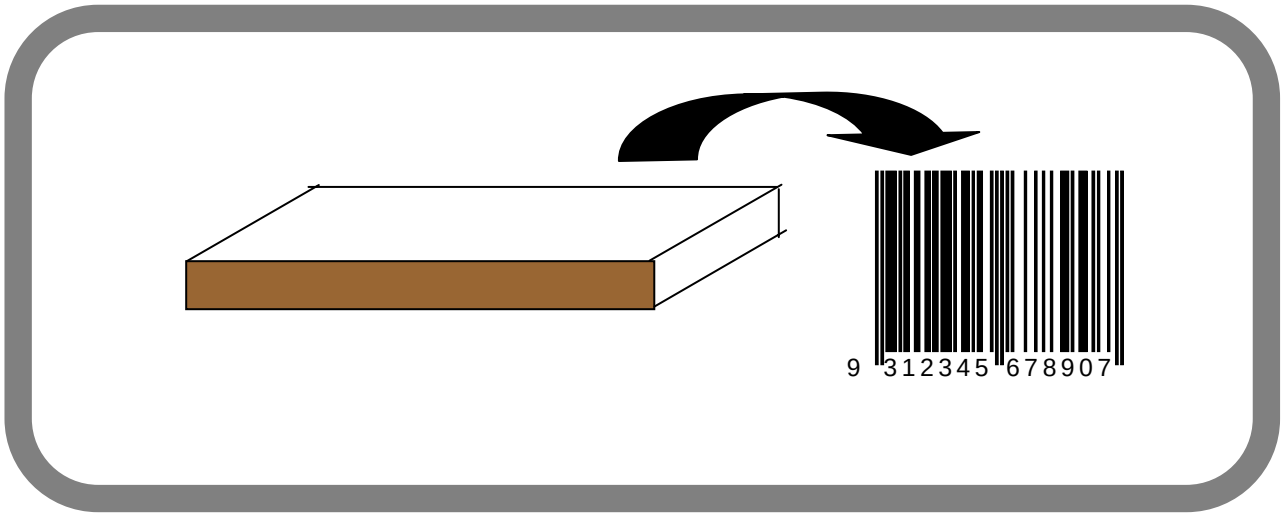
Within the Timber Industry the following panel configurations may fall with the category of a trade item sold at retail Point-of-Sale (POS) and thus must be numbered and bar coded according to the methods described in this section:

- Standard Pack see Section 12.5.2.1 for full definition
- Standard Piece see Section 12.5.2.3 for full definition

In Section 12.7 the Timber Sector group has defined specific recommendations pertaining to the allocation and use of GTIN's. The recommendations applicable for Panel Trade Items Sold at retail Point-of-Sale are P1, P2, P3, P4, P5 and P6.

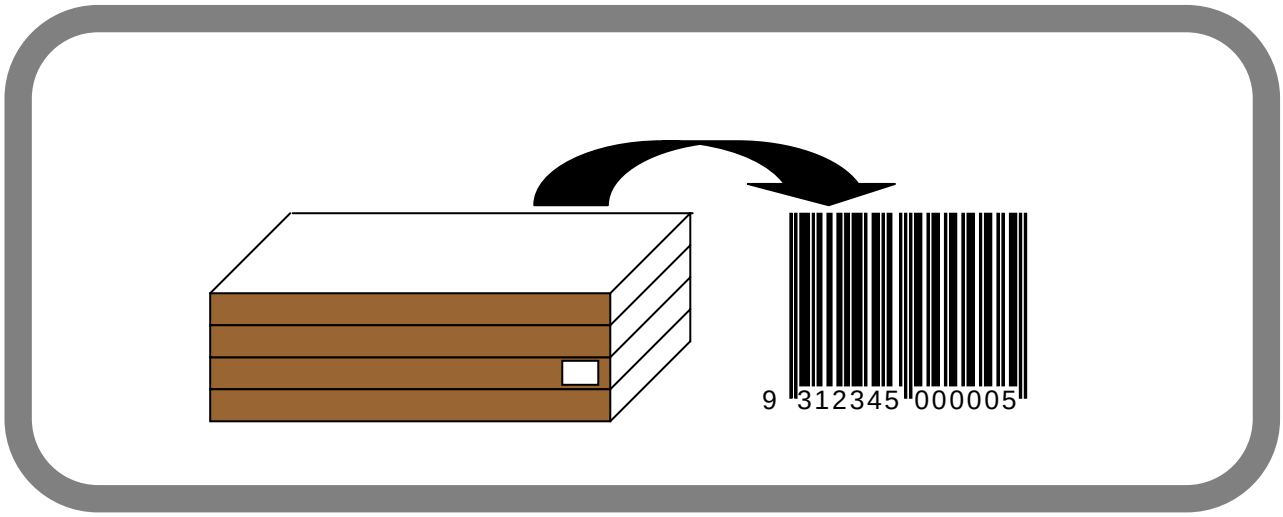
Example:

Diagram 39: Example of a panel allocated a GTIN-13 represented in an EAN-13 Bar Code Symbol



Example:

Diagram 40: Example of a pack of panels allocated a GTIN-13 represented in an EAN-13 Bar Code Symbol



12.6.2 Fixed Measure Trade Items NOT Sold at Retail Point-of-Sale (POS)

Where a trade item is sold at the retail Point-of-Sale (i.e. pack or piece of panel), then the applicable option described in Section 12.6.1 is applicable. However if the trade item is **not** sold in the Point-of-Sale environment, any of the options for the numbering and bar coding described in Section 7.2 are applicable.

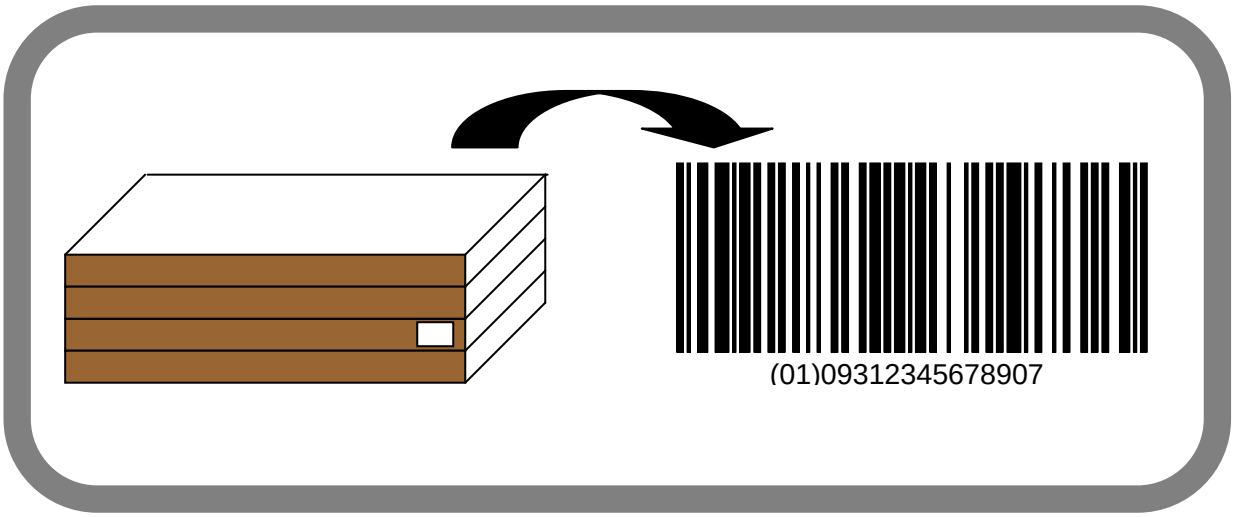
Within the Timber Industry the following panel configurations may fall with the category of a trade item not sold at retail Point-of-Sale (POS) and thus must be numbered and bar coded according to the methods described in this section:

- Standard Pack see Section 12.5.2.1 for full definition

In Section 12.7 the Timber Sector group has defined specific recommendations pertaining to the allocation and use of GTINs. The recommendations applicable for panel trade items **not** sold at retail Point-of-Sale are P1, P2, P3, P4, P5, P6 and P9.

Example:

Diagram 41: Example of a pack of panels allocated a GTIN-13 with a leading zero represented in a GS1-128 Bar Code Symbol



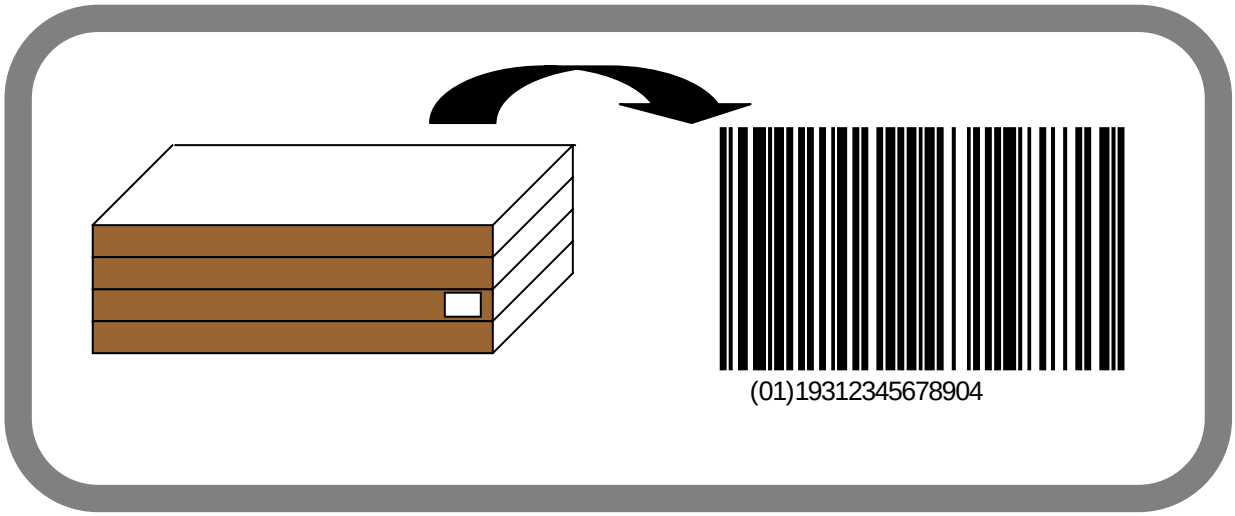
Alternatively a pack of panels may be allocated a GTIN-13 with a leading zero and have this represented in an ITF-14 Bar Code Symbol.

Note: In the example presented Diagram 41 the GTIN assigned must be unique and hence **must not** be the same as the GTIN assigned to the individual piece.

ALTERNATIVE OPTION

Alternatively the GTIN-14 option could have been used, see example below.

Diagram 42: Example of a standard pack of panels allocated a GTIN-14 |represented in a GS1-128 Bar Code Symbol



Alternatively a standard set pack of panels could be allocated a GTIN-14 which is represented in an ITF-14 Bar Code Symbol

12.6.3 Variable Measure Trade Items NOT Sold at Retail Point-of-Sale (POS)

As described in Section 7.3 trade items may be variable measure either because the production process does not guarantee consistency in weight, size or length etc. or because the items are created to meet a special order which states a quantity or measure (e.g. panels ordered in a certain size).

The use of a variable measure GTIN enables the identification of the variable piece of data to be included within the bar code symbol.

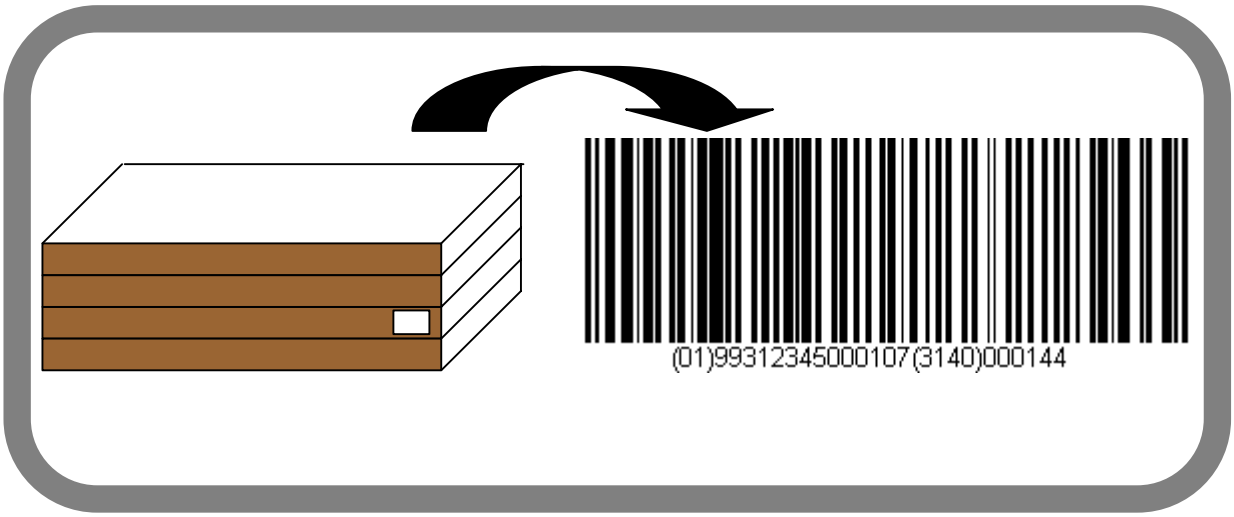
Note: This solution will not be available for trade items that are sold through a traditional retail Point-of-Sale environment as POS scanners are not set up to scan the GS1-128 Bar Code Symbol required for this application.

Within the Timber Industry panels that are cut to size and bulk fall within the category of a variable measure trade item **not** sold at retail Point-of-Sale (POS) and thus must be numbered and bar coded according to the methods described in this section:

Note: Discussion between trading partners should determine if there is a physical requirement to label each variable length size with its respective GTIN and bar code symbol.

Example:

Diagram 43: Example of a variable measure pack of panels represented by a GTIN with the leading nine with the associated area measurement represented in a GS1-128 Bar Code Symbol



In this example the total area of panels contained within the pack is 144 square metres.

Note: The solution illustrated does **not** permit the marking of this type of panel pack for sale at the retail Point-of-Sale. This could be achieved be encoding the data in a GS1 DataBar Bar Code Symbol provided the retail POS system that will capture and store the data is suitably enabled.

12.7 Panel Trade Item Recommendations

The following summarises the recommendations suggested for the implementation of the GS1 standards for panel trade items. The recommendations focus mainly on the allocation of GTINs to trade items and the suggested allocations at both piece and pack level, fixed and variable trade items. Refer to Section 12.6 for examples of some of the following recommendations.

Table 5: Panel Trade Item Recommendations

Recommendation Number[15]	Recommendation Statement
P1	A GTIN is assigned to each packaging level
P2	For pack trade items, the GTIN should predefine the pack size – unless this is impractical due to the multiplicity of pack sizes possible.
P3	For panel trade items with a single definable piece size, the GTIN should predefine the piece size – unless this is impractical due to the multiplicity of piece sizes possible.
P4	When ordering panels, customers should order using the GTIN that most fully defines the item, rather than using other less specific variable measure GTINs that might span multiple piece sizes or pack sizes.
P5	For panel piece trade items, a unique fixed measure GTIN, scannable at POS should be assigned for each piece length.
P6	Panels pack trade items should be assigned a unique fixed measure GTIN for each piece/pack size combination.
P9	The choice of which type of GTIN to use for fixed measure non-retail trade items (GTIN-13, GTIN-13 with filler zero or GTIN-14 with indicator between 1 and 8) is at the discretion of the supplier. However, a GTIN-13 is required for retail Point-of-Sale.

[15] The recommendation numbers listed can be referenced in the "Identification of Timber with the EAN/UCC Numbering Standard-Product Variability Considerations Version 1.0", which can be downloaded from www.hiwg.org.au

12.8 Attribute Information Options for the Timber Industry

In “principle” the Australasian Hardware Industry supports the use of variable data in the long term. Individual companies need to make their own assessment on the implementation and use of variable data in their business.

Suppliers may wish to enhance the traceability of their own products by introducing additional information over and above the allocation of a GTIN to each trade item.

When attribute information is applied to a trade item that is sold at POS then it can be added along side the EAN-13 Bar Code Symbol, (see below) or encoded in a GS1 DataBar Bar Code Symbol if the systems that will record the scanning of the item and the resulting GTIN are suitably enabled. Detailed information about GS1 DataBar can be found in Section 6.3.

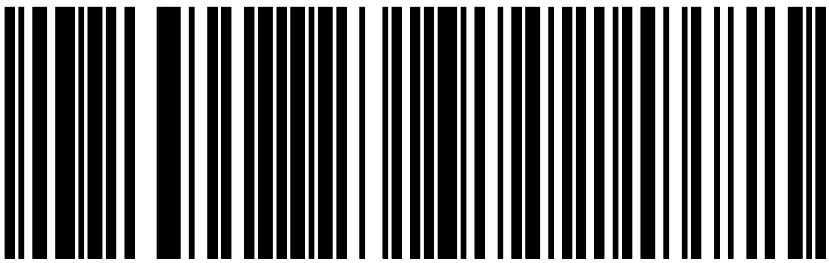
Where the trade item will not be sold at the retail POS attribute information can be concatenated (linked together) with the GTIN, in one single GS1-128 Bar Code Symbol as shown in Figure 17: Concatenated GS1-128 or a GS1 DataBar Bar Code Symbol.

For further information regarding Attribute Information please refer to Section 6.2 and also the HIWG recommendations document ‘Bar Coding Timber Packs v1.1’, which can be downloaded from www.hiwg.org.au

Figure 16: GTIN and serial number represented in separate bar code symbols

Note: The attribute information, in this example serial number, represented in the above figure will NOT scan at the Point-of-Sale. Where POS scanning is required GS1 DataBar may be considered.

Figure 17: Concatenated GS1-128 Bar Code Symbol



Note: The bar code symbol represented in the above figure will not scan at all Point-of-Sale systems

Note: The following section describes some of the Application identifiers that the Timber Industry sees as providing useful additional information. This does not preclude suppliers from accessing the entire list of AIs available for use.

12.8.1 Serial Number – Pack Number

Within the Timber Industry, the serial number assigned to a pack of timber may be referred to as a pack number. This is the serial number allocated to the pack of timber.

A serial number is a unique alpha or alphanumeric number assigned by a company to an entity for its lifetime. Combined with a GTIN the serial number uniquely identifies each individual trade item. Use any structure to generate the serial number. However, it must be possible for any company to use the combination GTIN and serial number for identifying a specific trade item, regardless of the actual structure of the number.

Figure 18: Serial Number AI (21) represented in a GS1-128 Bar Code Symbol

Note: The AI (21) must be associated with a GTIN

Diagram 44: Pack of Timber representing fixed measure GTIN and serial number in a GS1-128 Bar Code Symbol

12.9 Timber Industry Implementation Issues

The implementation process often identifies anomalies that exist with certain product types where the standard application of the GS1 System is either not feasible or not practical. This in no way indicates that the system is not used, merely identifies that standard methodologies currently available do not fit within the scope of that particular product.

This section has been developed to assist the industry identify these trade items and methods of dealing with these trade items through the supply chain, including final retail Point-of-Sale.

12.9.1 Variable Measure Trade Items Sold at Retail Point-of-Sale (POS)

Within the Timber Industry packs and pieces of timber are routinely traded between trading partners varying from wholesale through to the retail consumer market.

When suppliers allocate and apply GTINs to trade items the assumption is that the trade item will remain complete with no changes occurring to it during the supply chain process.

However, with the timber retail Point-of-Sale area there are times when the trade item is sold to the consumer with an ability for the consumer to specifically ask for altered lengths of timber, i.e. the retailer further cuts the timber to suit the consumer's requirements.

The following are some solutions available to trading partners to enable the automation of the trade item for sale at the retail Point-of-Sale:

1. The supplier allocates the trade item a standard GTIN-13 that identifies the trade item as **"Timber Piece Type X End section Y"** (but does not mark the trade item). The cost per metre of the trade item would be entered into the database; much like the cost of a standard trade item is linked to the GTIN of a product. This assigned GTIN is represented by an EAN-13 Bar Code Symbol and printed in what is commonly called a shadow book[16] with an appropriate description along side.

   At the point of purchase the operator would scan the appropriate GTIN and the system would need to be programmed to prompt the operator for the total length purchased. From here the system calculates the price accordingly and registers the sale.

2. The supplier allocates the trade item a standard GTIN-14 that identifies the trade item as **"Timber Piece Type X End section Y"** and would associate with it the length of the piece expressed in metres to whatever degree of accuracy – one, two or more decimal places – the retailer chose. This data would be concatenated (joined up) using Application Identifiers (01) and (311n) and encoded in a GS1 DataBar Bar Code Symbol that would be printed and applied either to the piece or to an associated docket. .

   At the Point-of-Sale the operator would scan the GS1 DataBar Bar Code Symbol as in any other retail POS transaction. The POS system would capture the GTIN-14 identifying the item and the length data indicating how much of it had been sold. Note that this option requires the POS scanning and data base system to be enabled for GS1 DataBar.

   3. An alternative to the above solutions is that the seller (normally a retailer) of the trade item assigns a restricted use GTIN instead of the supplier and follows the same procedure as described in subparagraph 1 above. Please consult the technical literature supplied by GS1 or

[16] A Shadow book is a book that contains the printed form of any GTINs assigned but not printed on the actual trade item, generally because it is not physically possible to do so. The shadow book provides the operator the ability to quickly reference trade items sold and scan the appropriate bar code symbol. It provides an automated solution for trade items that are not easily bar coded or that have a variable component dictated by the customer.

contact GS1 for further information on restricted use GTIN's.

12.9.2 Order Quantity Unit of Measure

Within the Timber Industry current order quantity units of measure (UOM) range from metres, metres cubed, pieces and packs. However a standardised approach to ordering of trade items in the unit of measure specified by the GTIN is the ultimate goal and all parties in the supply chain should endeavour to work towards this.

12.9.3 Damaged Packs

Through general transport and movement packs of timber and panels may be damaged. These packs may be identified uniquely with either the use of the combined use of the serial number issued at the point of packaging or alternatively with the use of the Serial Shipping Container Code (SSCC). For further information refer to Section 8.

13 Plumbing Industry Scenarios

13.1 Introduction

The GS1 System prides itself on having a complete set of recommendations and requirements to ensure that all parties throughout the supply chain are aided and not hindered by the implementation of its system.

The Hardware guidelines have been written to provide a snapshot view of the GS1 System. Used in conjunction with the technical literature supplied by GS1 and assistance from GS1 they have been designed to identify the key components of the system and enable suppliers within the industry to begin implementation throughout their business.

In developing the numbering and bar coding guidelines for the Hardware Industry, the finer detail depends largely on the way in which material is routinely traded. When the identification of a trade item is practised as part of a business solution, there is firstly a mandatory requirement for information at item level. Beyond this there may be the requirement to incorporate additional information such as batch number, serial numbers or even production dates. These guidelines serve to identify any such requirements that the industry has chosen and highlight them in a practical example.

The following section of the Hardware guidelines focuses on providing examples of trade items that exist within the Plumbing Industry and the methods of allocating GTINs. This is key foundation to implementation of other aspect of the GS1 System and the content covered in this chapter assumes some prior knowledge of GTINs and bar coding. Therefore, it is important readers of this section of the document refer to earlier chapters for reference material.

It is not feasible to include every possible variation of trade item available in such a document. It is up to suppliers to identify their own products and the associated method by which to allocate a GTIN and the respective bar code symbol type to use.

In 2002, input into this section of the Hardware Industry Guidelines was provided by the members of the Plumbing Sector group of the Hardware Industry Working Group (HIWG). Since then, any updated versions of this document have also been reviewed by the group. For more information refer to www.hiwg.org.au.

13.2 GTIN Options for Plumbing Trade Items

In Section 7 the methods for allocating and representing GTINs is described in detail and should be referred to when reviewing the following scenarios

13.2.1 Trade Items Sold at Retail Point-of-Sale (POS)

Trade items that are sold to a trading partner for sale ultimately at a retail Point-of-Sale environment must be numbered and bar coded as described in Section 7.1.

In summary the recommendations stipulate that the POS trade item **must** be assigned a unique GTIN using the GTIN-13 structure and represented in an EAN-13 Bar Code Symbol and for every different variation of a product a separate GTIN must be assigned. GS1 DataBar may be an option in situations where the retail POS systems that will process sales of the item are suitably enabled.

Note: Unless products are to be sold in the North America and Canada, companies will generally use the EAN-13 Bar Code Symbol. Please consult with GS1 if your trade item is to be sold within North America and Canada.

Example:

Diagram 45: Example of a tap allocated a GTIN-13 represented in an EAN-13 Bar Code Symbol

The following list depicts additional examples of different trade items that would be assigned a separate GTIN for use within the Point-of-Sale environment.

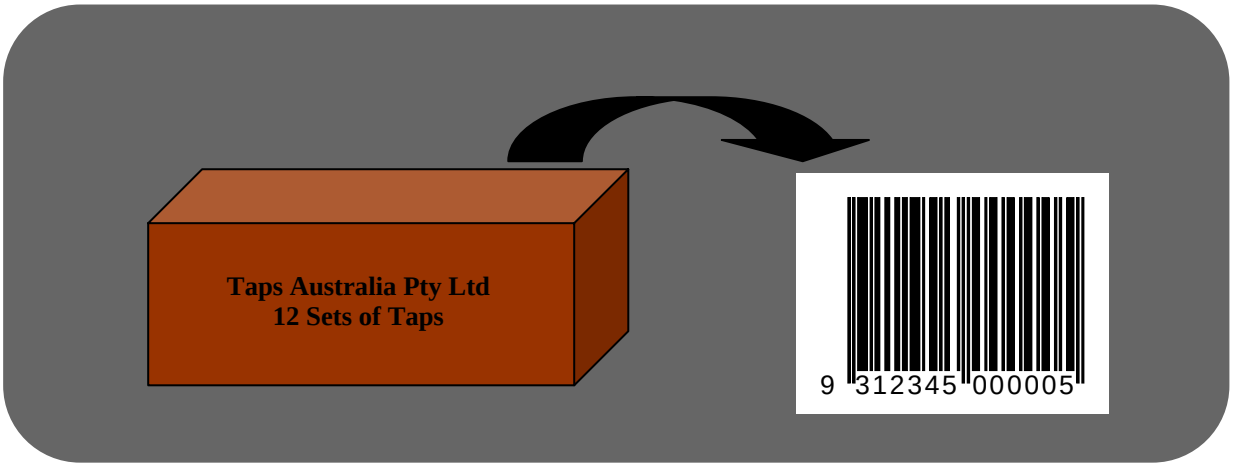
- Deluxe Toilet Seat - White
- Deluxe Toilet Seat - Mist Grey
- Classic II Rainmaker Shower Rose - Chrome
- Classic II Rainmaker Shower Rose - White
- Elite Mark II Basin Set - White/Gold
- Elite Mark II Top Assembly - Basin - White/Gold
- Elite Mark II Shower Set - White/Gold
- Flickmixer Jupiter Basin Mixer - Chrome
- Flickmixer Venus Basin Mixer - Chrome
- Roll of Copper Coil 18m x 6 x 0.9
- Roll of Copper Coil 30m x 6 x 0.9

- 1 x 100mm Heavy Duty Revolutionary Underground Conduit - 4m/length - Orange
- 1 x 125mm Heavy Duty Revolutionary Underground Conduit - 4m/length – Orange
- etc……

Note: Listed examples in no way depict every different type of trade item available; they serve only to provide an example of different product types requiring a separate GTIN.

If a trade item is bundled into a stable grouping (e.g. a carton of taps) which itself can be sold at Point-of-Sale then a separate GTIN must be assigned.

Diagram 46: Example of a carton of taps allocated a GTIN-13 represented in an EAN-13 Bar Code Symbol



The following list depicts additional examples of different trade items that would be assigned a separate GTIN for use within the point or sale environment.

- Pack of 3 - Elite Mark II Wall Dress Rings – Chrome
- Pack of 6 – Chrome 10cm Door Handle
- etc….

Note: Each packaging level, if sold at retail POS, must have a separate GTIN represented by a GTIN-13 and EAN-13 Bar Code Symbol.

13.2.2 Trade Items NOT Sold at Retail Point-of-Sale (POS)

Where a trade item is sold at the retail Point-of-Sale (i.e. the tap), then the option described in Section 13.2.1 is applicable. However if the trade item, is then bundled into stable grouping (e.g. a carton of taps) but this unit itself is **not** sold in the Point-of-Sale environment, any of the options for the numbering and bar coding described in Section 7.2 are applicable.

Note: Every variation in the quantity of trade items is assigned a separate GTIN. If the variations differ for every different order a Variable Measure GTIN should be assigned, see Section 7.3 and 13.2.4 for further information.

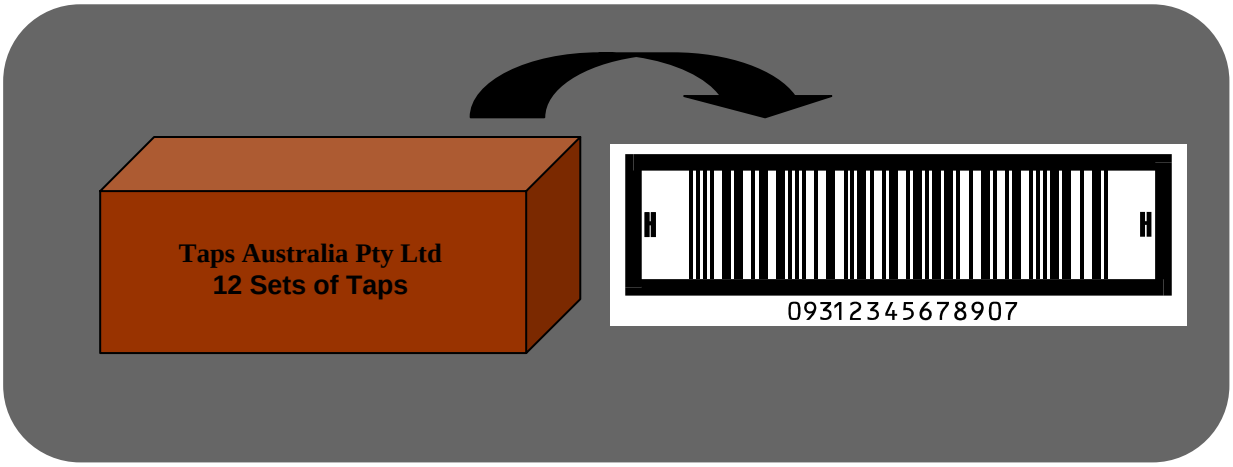
It is generally left to the discretion of the company marking the goods as to which option to use to mark the product.

Types of trade items within the Plumbing Industry that would be considered in this section include cartons of retail units (e.g. taps), crates of pipe, boxed quantities of copper tubing etc.

Example:

Diagram 47: Example of a carton of taps allocated a GTIN-13 with a leading zero represented in a GS1-128 Bar Code Symbol

Diagram 48: Example of a carton of taps allocated a GTIN-13 with a leading zero represented in an ITF-14 Bar Code Symbol



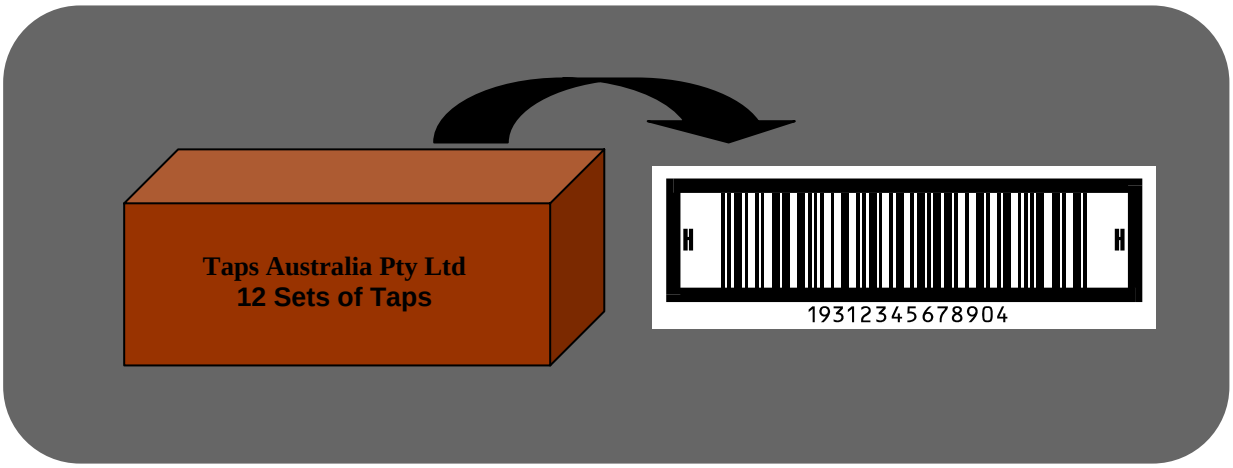
Note: In the examples presented in Diagram 47 and Diagram 48 the GTIN assigned must be unique and hence **must not** be the same as the GTIN assigned to the individual piece.

ALTERNATIVE OPTION

Alternatively the GTIN-14 option could have been used, see example below.

Diagram 49: Example of a carton of taps allocated a GTIN-14 represented in a GS1-128 Bar Code Symbol

Diagram 50: Example of a carton of taps allocated a GTIN-14 represented in an ITF-14 Bar Code Symbol



The following list depicts additional examples of different trade items (not sold at retail POS) that should be assigned a separate GTIN.

- 1 Pack (54) x 100mm Heavy Duty Underground Conduit - 4m/length - Orange
- 1 Pack (38) x 125mm Heavy Duty Underground Conduit - 4m/length - Orange
- Box of 6 x 18m Roll of Copper Coil
- etc….

13.2.3 Trade Items Sold as Kits

Within the Plumbing Industry there are some trade items that can be sold in a kit form, e.g. toilet suites.

Where a trade item is sold as a kit comprising of a number of different components the following points are applicable:

- If the components that make up the kit can be sold individually each component must be allocated a unique GTIN. Suppliers must ensure that any bar code symbols identifying the individual components are obscured if placed together as one unit.
- Each kit must be assigned a unique GTIN. In the event that a kit is sold but distributed in its component parts, at separate times, care must be taken to ensure that only the GTIN associated with the kit is clearly displayed on each component and any GTINs identifying the individual components is obscured. Please refer to Section 13.5 for further implementation issues.
- Any combinations of individual components that make up a kit must be uniquely identified with a separate GTIN.

Example:

Diagram 51: Toilet Suite comprising three components all marked with the GTIN-13 represented in the EAN-13 Bar Code Symbol

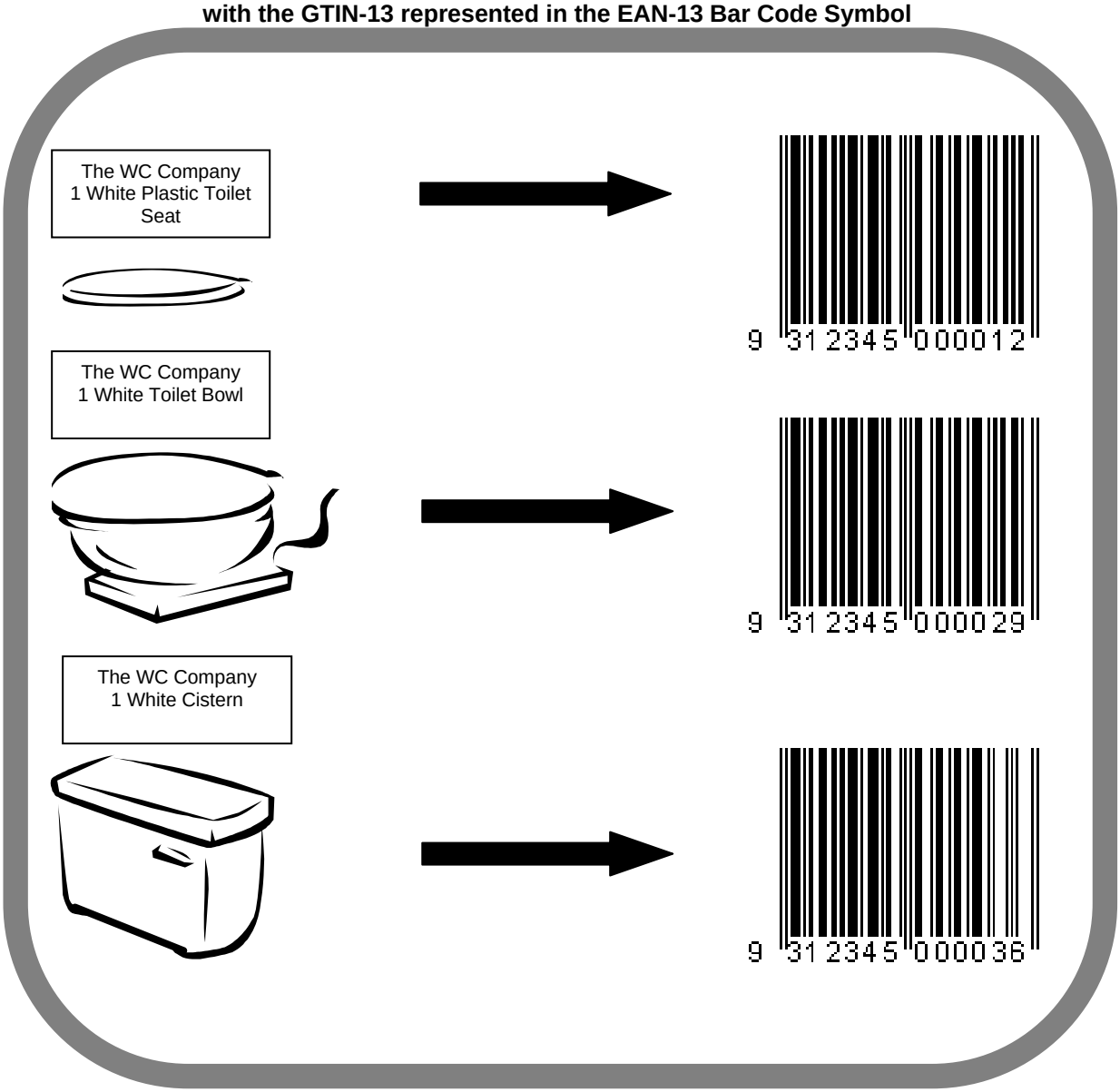
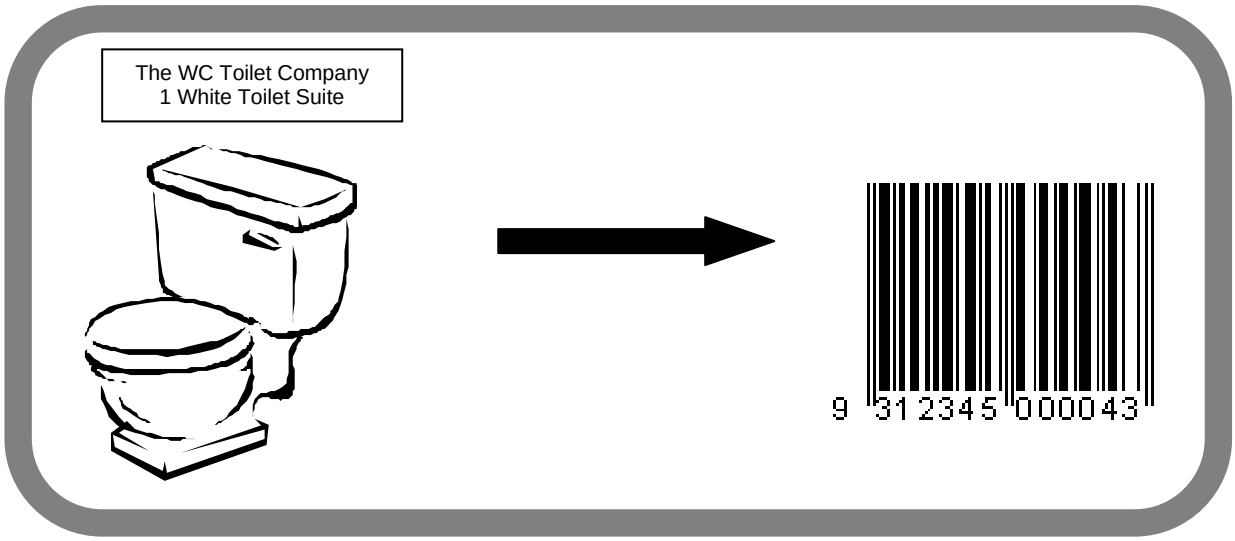


Diagram 52 Toilet Suite bundled together marked with its own unique GTIN in the GTIN-13 format



The following description depicts another example of trade items sold as both individual components and a kit. As described above each component would be assigned a unique GTIN, with the kit assigned its own unique GTIN.

- G Series Exposed Breech Wall Set - Brass
  - 4 Components each with own GTIN:
    - G Series Exposed Breech Wall
    - G Series Exposed Sets Outlet
    - G Series Lever Handle Sub Assembly
    - G Series Spout Adapter
- etc…

Note: This example in no way depicts every different type of trade item available; it serves only to provide a real life example.

13.2.4 Variable Measure Trade Items NOT Sold at Retail Point-of-Sale (POS)

As described in Section 7.3 trade items may be variable measure either because the production process does not guarantee consistency in weight, size or length etc, or because the items are created to meet a special order which states a quantity (e.g. roofing ordered by the square metre).

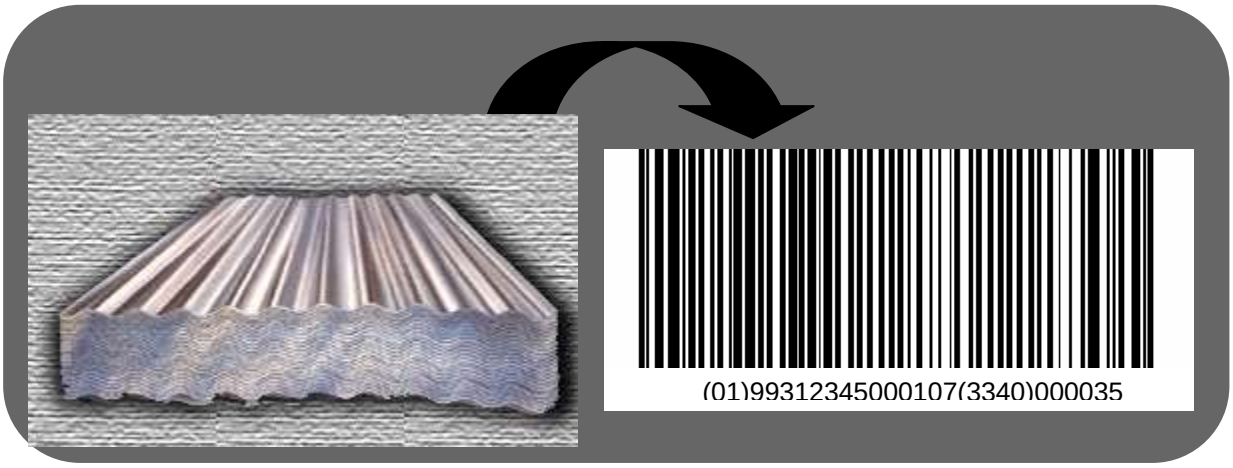
The use of a variable measure GTIN enables the identification of the variable piece of data to be included within the bar code symbol.

Note: This solution will not be available for trade items that are sold through a traditional retail Point-of-Sale environment as POS scanners are not set up to scan the GS1-128 Bar Code Symbol required for this application. Where sale through a retail POS is intended the options provided in paragraph 13.3 below may be considered.

The following example depicts the assigned GTIN and GS1-128 Bar Code Symbol represented on a pack of 35 square metres of roofing requested from a customer.

Example:

Diagram 53: Colorbond Stainless Steel Roofing Sheets 35 square metres



13.3 Attribute Information Options for the Plumbing Industry

In “principle” the Australasian Hardware Industry supports the use of variable data in the long term. Individual companies need to make their own assessment on the implementation and use of variable data in their business.

Suppliers may wish to enhance the traceability of their own products by introducing additional information over and above the allocation of a GTIN to each trade item.

When attribute information is applied to a trade item that is sold at POS then it can be added along side the EAN-13 Bar Code Symbol, (see below) or encoded in a GS1 DataBar Bar Code Symbol if the systems that will record the scanning of the item and the resulting GTIN are suitably enabled. Detailed information about GS1 DataBar can be found in Section 6.3.

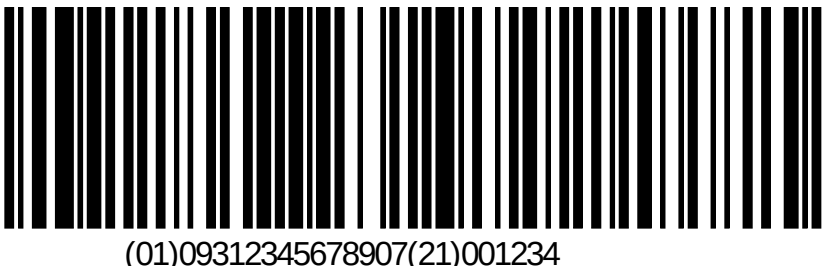
Where the trade item will not be sold at the retail POS attribute information can be concatenated (linked together) with the GTIN, in one single GS1-128 Bar Code Symbol as shown in Figure 20: Concatenated GS1-128 Bar Code Symbol, or in a GS1 DataBar Bar Code Symbol.

For further information regarding Attribute Information please refer to Section 6.2.

Figure 19: GTIN and serial number represented in separate bar code symbols

Note: The attribute information, in this example serial number, represented in the above figure will NOT scan at the Point-of-Sale.

Figure 20: Concatenated GS1-128 Bar Code Symbol



Note: The bar code symbol represented in the above figure will not scan at the Point-of-Sale

13.3.1 Application Identifiers Used in the Plumbing Industry

The table represented below identifies some of the AIs that may be considered by companies within the Plumbing Industry.

It is recommended that suppliers/manufacturer/distributors consult with GS1 on the use of these or any other Application Identifiers to ensure that compliance to the standards is adhered to at all times.

Note: Whilst the table listed below lists specific AIs that may be relevant for use within the Plumbing Industry it does not preclude suppliers from accessing the entire list of AIs available for use. Refer to GS1 Australia's website www.gs1au.org under the download section for a complete list of list of AIs available.

			Format	
AI	**Notes**	**Content**	**AI**	**Data**
00		Identification of a logistic unit (SSCC)	n2	n18
01		Identification number (GTIN) of a trade item	n2	n14
02		Identification of trade items (GTIN) contained in a logistic unit	n2	n14
10		Batch or Lot Number	n2	an..20
11	a	Production Date (YYMMDD)	n2	n6
13	a	Packaging Date (YYMMDD)	n2	n6
15	a	Best Before Date (YYMMDD)	n2	n6
17	a	Expiration Date (YYMMDD)	n2	n6
20		Product Variant	n2	n2
21		Serial Number	n2	an..20
240		Additional product identification assigned by the manufacturer	n2	an..30
30		Variable Count	n2	n..8
37		Count of trade items contained in a logistic unit	n2	n..8
311	c	Length or first dimension, metres trade	n2	n6

a: when indicating only a year and month, fill DD with 00
c: indicates plus one digit for decimal point indication

13.3.2 Serial Number

The Application Identifier (21) is used to define a serial number.

A serial number is a unique alpha or alphanumeric number assigned by a company to an entity for its lifetime. Combined with a GTIN the serial number uniquely identifies each individual trade item. Use any structure to generate the serial number. However, it must be possible for any company to use the combination GTIN and serial number for identifying a specific trade item, regardless of the actual structure of the number.

In Plumbing Industry, the traceability of hot water services could be automated by applying the combination of the GTIN and the serial number to uniquely identify each and every hot water service., thus allowing for better tracking of service history and warranty follow up.

Note: The AI (21) must be associated with a GTIN

Figure 21: Serial Number AI (21) represented in a GS1-128 Bar Code Symbol

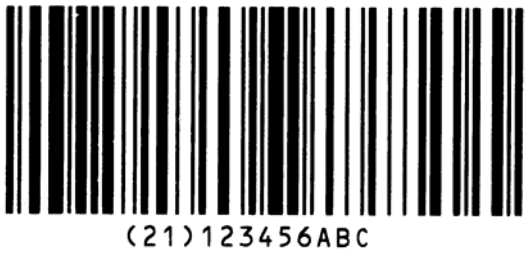


Diagram 54 Hot water service marked with a GTIN and serial number.

Note: When sold at a retail Point-of-Sale system the label affixed on the carton should represent the EAN-13 Bar Code Symbol format of the GTIN assigned with the serial number along side as represented in Figure 19. (The GTIN assigned is the same just represented in a different bar code symbol type.) Alternatively the use of GS1 DataBar Bar Code Symbol may be considered if the retail POS system that will process the sale of the item is suitably enabled.

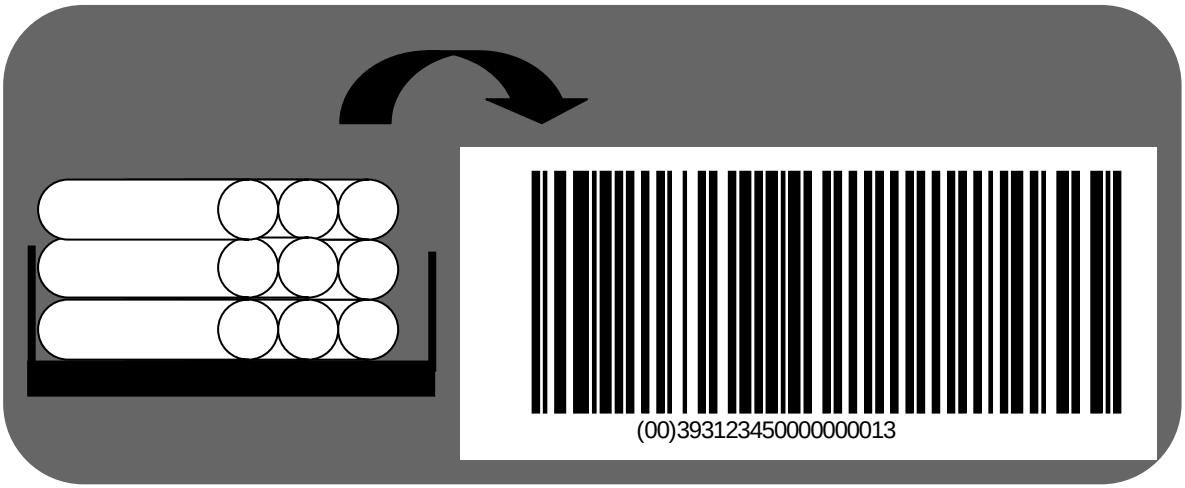
13.4 Logistic Unit Marking for the Plumbing Industry

The identification of standard and variable measure trade items is achieved by the allocation of unique GTINs. The natural progression from the identification of a trade item is to the identification of a logistic unit.

A logistic unit is an item of any composition established for transport and/or storage, which needs to be managed through the supply chain. The identification of a logistic unit can be achieved using an SSCC (Serial Container Shipping Code). See Section 8 for information about the usage of the SSCC.

Example:

Diagram 55: Use of the SSCC on a logistics unit



Note: The SSCC would be represented on a label with a format depicted in Section 8.3.

13.5 Plumbing Industry Implementation Issues

In some circumstances the option to physically apply a bar code symbol to a trade item is neither possible nor practical, for example, tiny screws and nuts sold individually. In other cases the trade item sold between trading partners are then broken down further into variable sizes the size of which is dictated by the consumer. These trade items may require additional thought as the final processes required to either on sell, mark or in fact identify them using GS1 standards.

This section has been developed to assist the industry identify trade items that may not necessarily have an obvious GS1 solution that is presented in this guideline and provide methods of handling these trade items through the entire supply chain.

13.5.1 Variable Measure Trade Items Sold at Retail Point-of-Sale (POS)

It has been identified within the Plumbing Industry that some trade items sold to trading partners begin as standard items allocated a standard GTIN. For example, coils of conduit. These trade items are traded as coils of standard lengths, for example 50m, 100m, and 150m etc, all of which receive their own unique GTIN as described in Section 7.

This trade item can then be sold to the consumer in any number of variations of lengths generally dictated by the consumer at the point of purchase. The following possible solutions are available to trading partners to enable the automation of the trade item, (generally required at the retail Point-of-Sale).

1. The supplier allocates the trade item a standard GTIN-13 that identifies the trade item as **"Conduit Type X Variable Measure"** (but does not mark the trade item). The cost per metre of the trade item would be entered into the database; much like the cost of a standard trade item is linked to the GTIN of a product. This assigned GTIN is represented by an EAN-13 Bar Code Symbol and printed in what is commonly called a shadow book[17] with an appropriate description along side.

   At the point of purchase the operator would scan the appropriate GTIN and the system would need to be programmed to prompt the operator for the total length purchased. From here the system calculates the price accordingly and registers the sale.

2. The supplier allocates the trade item a standard GTIN-14 that identifies the trade item as **"Conduit Type X Variable Measure"** and would associate with it the length of the piece expressed in metres to whatever degree of accuracy – one, two or more decimal places – the retailer chose. This data would be concatenated (joined up) using Application Identifiers (01) and (311n) and encoded in a GS1 DataBar Bar Code Symbol that would be printed and applied either to the item or to an associated docket. .

   At the Point-of-Sale the operator would scan the GS1 DataBar Bar Code Symbol as in any other retail POS transaction. The POS system would capture the GTIN-14 identifying the item and the length data indicating how much of it had been sold. Note that this option requires the scanning and POS systems to be enabled for GS1 DataBar.

3. An alternative to the above solutions is that the seller (normally a retailer) of the trade item assigns a restricted use GTIN instead of the supplier and follows the same procedure as

[17] A Shadow book is a book that contains the printed form of any GTINs assigned but not printed on the actual trade item, generally because it is not physically possible to do so. The shadow book provides the operator the ability to quickly reference trade items sold and scans the appropriate bar code symbol. It provides an automated solution for the trade items not easily bar coded or have a variable component dictated by the customer.

described in subparagraph 1 above. Please consult the technical literature supplied by GS1 or contact GS1 for further information on restricted use GTINs.

4. If the trade item will only be sold in set lengths from the coil, e.g., always in 1m sections, then each metre could be marked with its own unique GTIN allocated by the supplier. This then allows the operator at the POS to scan each bar code symbol identifying one single metre unit. This solution may require specific printing techniques and equipment and is only applicable if the length is set standard length blocks.

13.5.2 Trade Items Sold as Kits

In Section 13.2.3 the solution for the marking and distribution of trade items sold both as kits and individual components is provided. It is identified that in some instances the trade item, the kit, is sold as a complete unit but transported in its components not necessarily all at the same time. In this instance trading partners will need to confirm between them the best method of tracking all component parts to ensure that the complete set is ultimately delivered.

One method of doing this would be to identify via the GTINs allocated that the combination of all component GTINs is equivalent to the GTIN assigned to the entire kit. In this case upon receipt of the goods, the customer can scan the individual components and flag that only two of the three parts has been received. Once all components, in this example the third, are receipted the system updates the receipt of a complete kit.

For example:

The combination of a White Toilet Suite could be represented as:

9312345000043 = 9312345000012 + 9312345000029 + 9312345000036

Where:	White Toilet Suite =	9312345000043
	White Plastic Seat =	9312345000012
	White Bowl =	9312345000029
	White Cistern =	9312345000036

Upon scanning the GTIN comprising of the suite, the system may request that the operator scan for each of the individual components to complete the receipt of the goods. Should one or more components be missing then this is flagged accordingly as an incomplete order.

This solution will require programming from within the IT department of each company. In addition information such as purchase order numbers and logistic unit marking may be required to ensure that there is unique identification of the original order and that in the event that only components are priced and invoiced that this is not associated with the receipt of a kit.

Please consult with GS1 for further assistance on this matter

14 Electrical Industry Scenarios

14.1 Introduction

The GS1 System prides itself on having a complete set of recommendations and requirements to ensure that all parties throughout the supply chain are aided and not hindered by the implementation of its system.

The Hardware Industry guidelines have been written to provide a snapshot view of the GS1 standards. Used in conjunction with the technical literature supplied by GS1 and assistance from GS1 they have been designed to identify the key components of the system and enable suppliers within the industry to begin implementation throughout their business.

In developing the numbering and bar coding guidelines for the Hardware Industry, the finer detail depends largely on the way in which material is routinely traded. When the identification of traded items is practised as part of a business solution, there is firstly a mandatory requirement for information at item level. Beyond this, there may be the requirement to incorporate additional information such as batch number, serial numbers or even production dates. These guidelines serve to identify any such requirements that the industry has chosen and highlight them in a practical example.

The following section of the Hardware guidelines focuses on providing examples of trade items that exist within the industry and the methods of allocating Global Trade Item Numbers (GTINs). This is key foundation to implementation of other aspect of the GS1 System and the content covered in this chapter assumes some prior knowledge of GTINs and bar coding. Therefore, it is important readers of this section of the document refer to earlier chapters for reference material.

It is not feasible to include every possible variation of trade item available in such a document. It is up to suppliers to identify their own products and the associated method by which to allocate a GTIN and the respective bar code symbol type applicable.

In 2004, input into this section of the Hardware Industry Guidelines was provided by the members of the Plumbing Sector group of the Hardware Industry Working Group (HIWG). Since then, any updated versions of this document have also been reviewed by the group. For more information refer to www.hiwg.org.au.

14.2 GTIN Options for Electrical Trade Items

In Section 7 the methods for allocating and representing GTINs are described in detail and should be referred to when reviewing the following scenarios.

Regardless of the manner in which the trade item is sold, whether it is a carton of white light switches with a standard count or individual light switches of different colours each product variant must be assigned its own unique GTIN. For example if light globes are sold in inner packs of 5 and 10, each inner pack size must be assigned its own unique GTIN. If these trade items that are then packed into cartons of 100 and 50 respectively, these two variations also would be assigned separate GTINs.

The decision about which GTIN structure and data carrier are used is generally left to the discretion of each individual company and is ultimately governed by factors such as requirements within the company for the marking of additional information, the path of the trade item through the supply chain and whether the trade item will be sold in a retail Point-of-Sale environment.

14.2.1 Trade Items Sold at Retail Point-of-Sale (POS)

Trade items that are sold to a retailer for sale in the Point-of-Sale environment must be numbered and bar coded as described below. In summary the recommendations stipulate that the trade item should normally be assigned unique GTINs using the GTIN-13 structure and represented in an EAN-13 Bar Code Symbol.

Note: All variations of a product require a separate GTIN.

Note: Unless products are to be sold in the North American and Canadian retail market, companies will generally use the EAN-13 Bar Code Symbol. Please consult with GS1 if your trade item is to be sold within North America and Canada.

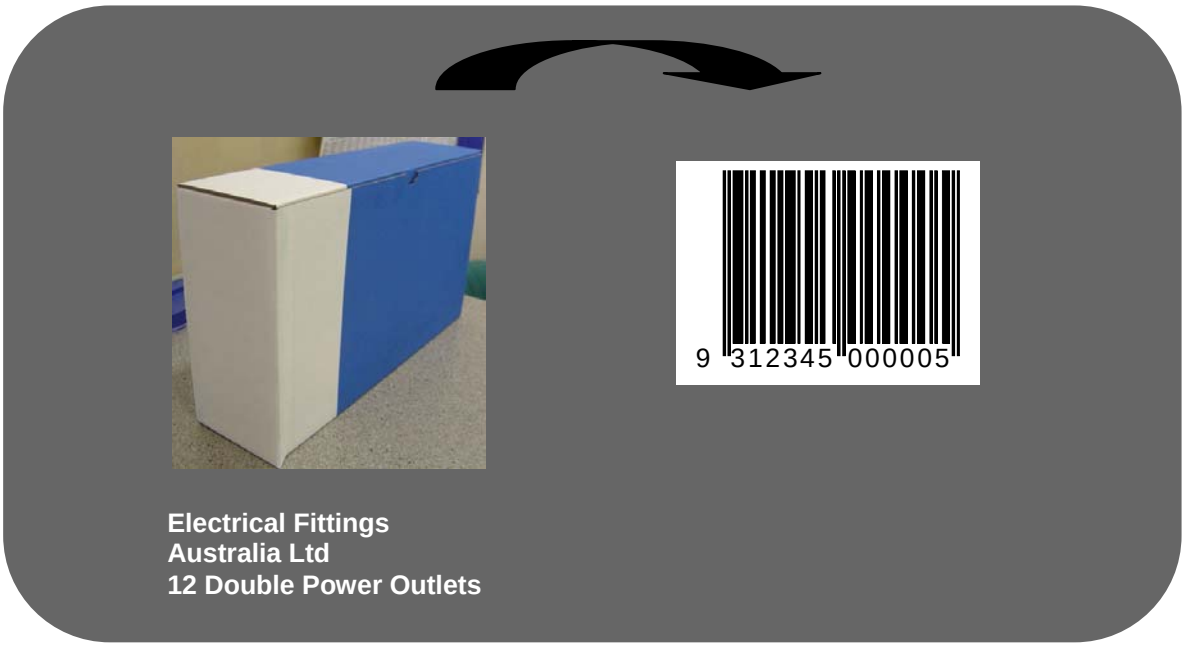
Diagram 56: Example of a double power outlet allocated a GTIN-13 represented in an EAN-13 Bar Code Symbol

The following list depicts additional examples of different trade items that would be assigned a separate GTIN for use within the Point-of-Sale environment.

- Batten Lamp Holder – White
- Batten Lamp Holder – Beige
- Remote Control Door Chime – Model DC490
- Remote Control Door Chime – Model DC580
- Individually Switched 4 Outlet Power Board
- Individually Switched 6 Outlet Power Board
- Domestic Power Lead 240V 10amp – 2 metre
- Domestic Power Lead 240V 10amp – 3 metre
- Domestic Power Lead 240V 10amp – 5 metre
- Etc……

Note: The examples listed above in no way depict every different type of trade item available they serve only to provide an example of different product types requiring a separate GTIN.

Diagram 57: Example of a carton of double power outlets allocated a GTIN-13 represented in an EAN-13 Bar Code Symbol



The following list depicts additional examples of different trade items that would be assigned a separate GTIN for use within the Point-of-Sale environment.

- Pack of 24 - Double Architrave Switches – White
- Pack of 12 - Batten Lamp Holders – Beige
- Etc…..

Note: Each packaging level, if sold at retail POS, must have a separate GTIN represented by a GTIN-13 and EAN-13 Bar Code Symbol.

The EAN-13 numbering and bar coding option **must** be used when a carton of stock most commonly found in a warehouse environment is also sold at the retail Point-of-Sale. In the event that the carton will never be sold at Point-of-Sale the above and following options are available.

14.2.2 Trade Items NOT Sold at Retail Point-of-Sale (POS)

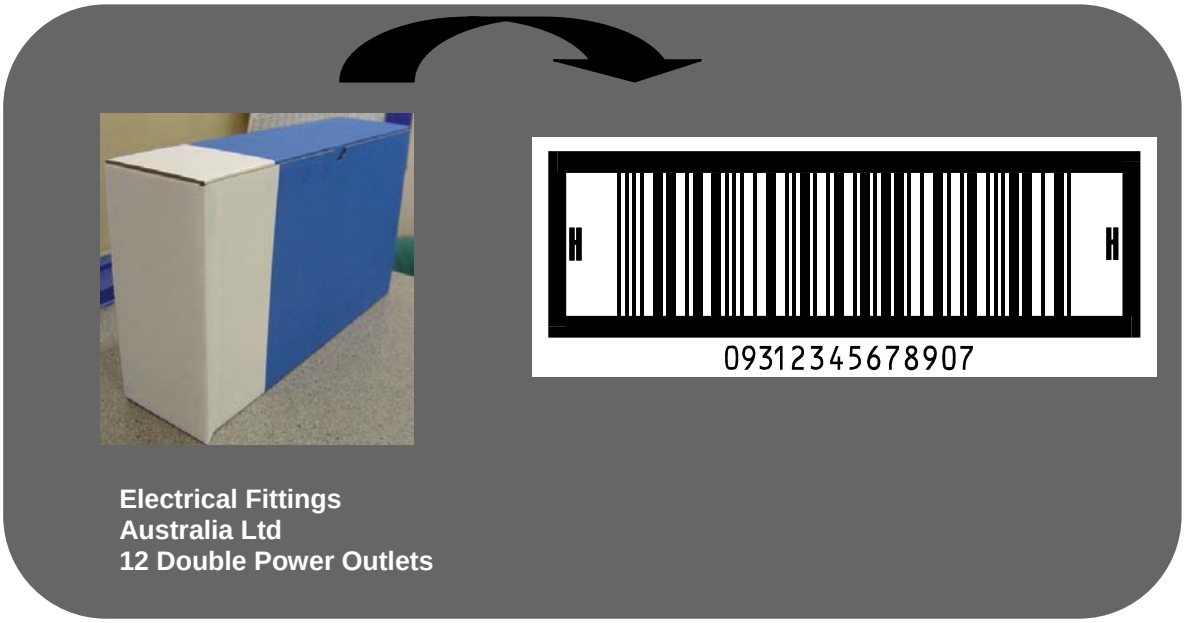
Where a trade item is sold at the retail Point-of-Sale (e.g., a double power point), the option described in Section 11.2.1 is applicable. However if the trade item is bundled into a stable grouping (i.e. a carton of 12 double power points) and this unit itself is **not** sold in the Point-of-Sale environment, any of the options for the numbering and bar coding described in Section 7 are applicable.

Note: Every variation (different pack size, colour, etc) requires a separate GTIN. When variation in the product measure occurs between each different instance an item is ordered a Variable Measure GTIN should be assigned, see Section 7.3 and 11.2.3 for further information.

It is generally left to the discretion of the company marking the goods as to which option to use to mark the product.

Diagram 58: Example of a carton of double power outlets allocated a GTIN-13 with a filler zero represented in a GS1-128 Bar Code Symbol

Diagram 59: Example of a carton of double power outlets allocated an GTIN-13 with a filler zero represented in an ITF-14 Bar Code Symbol



Note: In the examples presented in Diagram 58: Example of a carton of double power outlets allocated a GTIN-13 with a filler zero represented in a GS1-128 and Diagram 59: Example of a carton of double power outlets allocated an GTIN-13 with a filler zero represented in an ITF-14 the GTIN assigned must be unique and hence **must not** be the same as the GTIN assigned to the individual piece.

ALTERNATIVE OPTION

Alternatively the Indicator option could have been used, see example below.

Diagram 60: Example of a carton of double power outlets allocated a GTIN-14 using the Indicator method, represented in a GS1-128 Bar Code Symbol

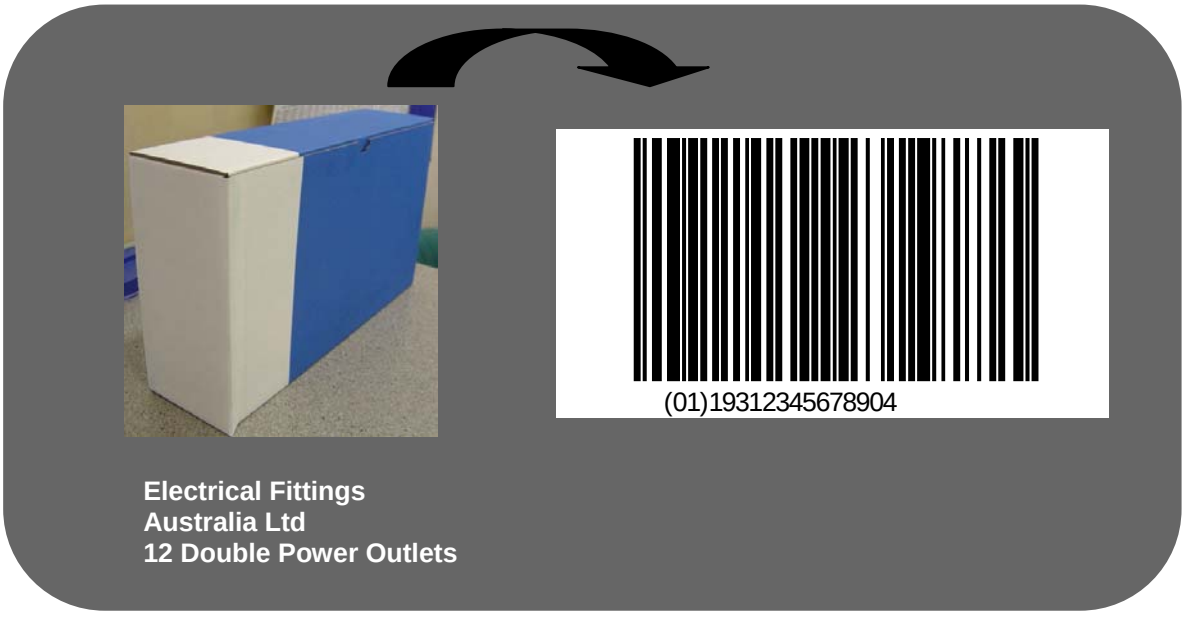
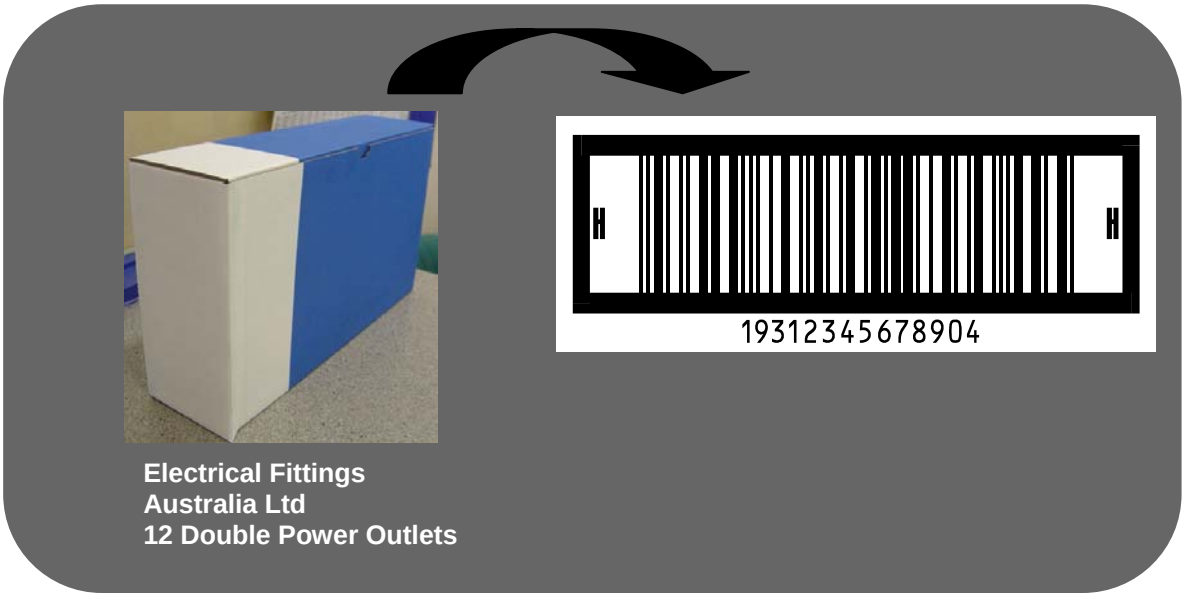


Diagram 61: Example of a carton of double power outlets allocated a GTIN-14 using the Indicator method, represented in an ITF-14 Bar Code Symbol



The following list depicts additional examples of different trade items found in the Electrical Industry (not sold at retail POS) that should be assigned a separate GTIN.

- Carton of 54 – Batten Lamp Holders – White
- Carton of 100 – Standard Junction Boxes – White
- Carton of 60 – Raised Mounting Blocks – White
- Etc…….

14.2.3 Trade Items Sold as Kits

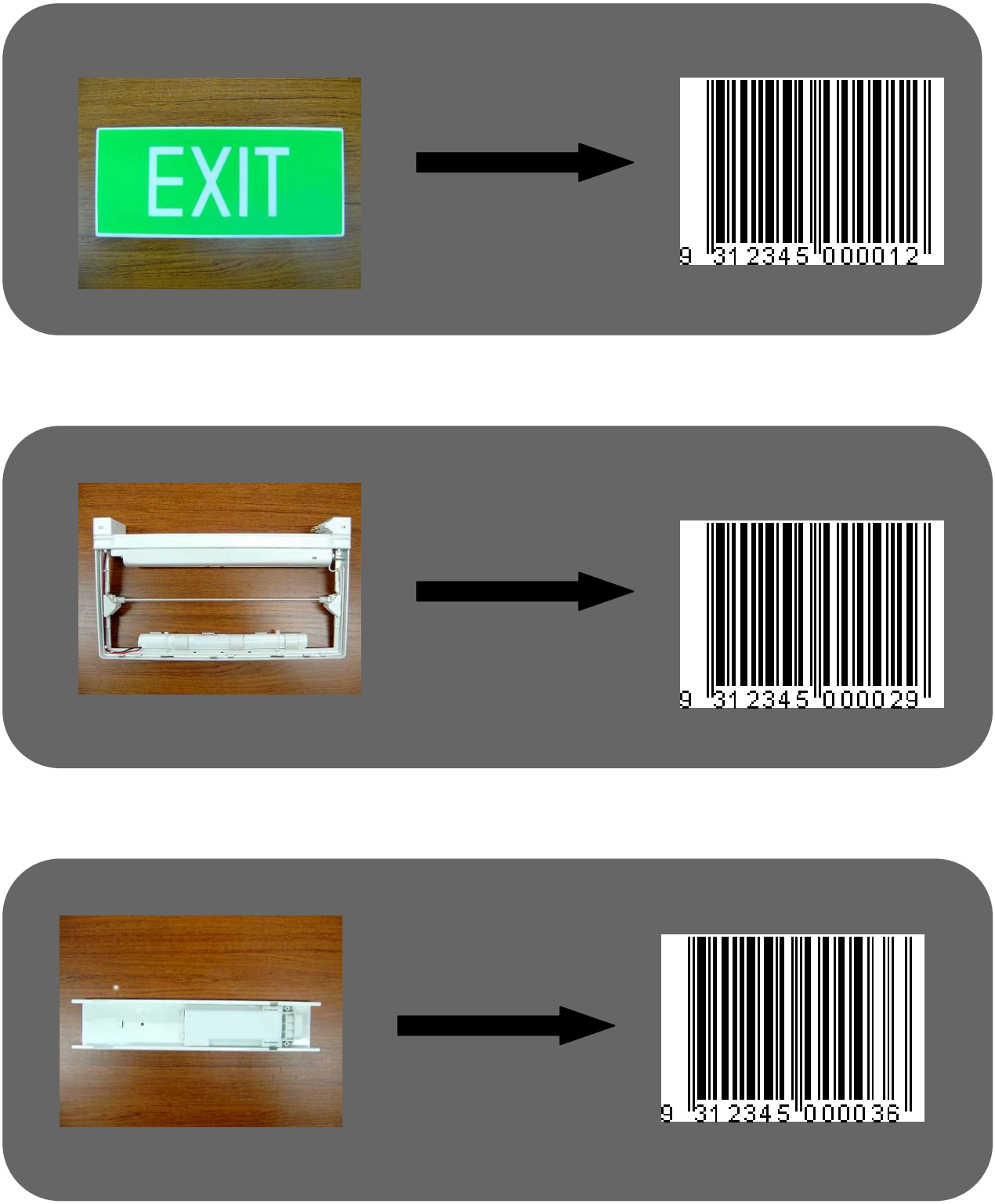
Within the Electrical Industry there are some trade items that can be sold in a kit form, e.g. Garden Lighting Kits.

Where a trade item is sold as a kit comprising of a number of different components the following points are applicable:

- If the components that make up the kit can be sold individually each component must be allocated a unique GTIN. Suppliers must ensure that any bar code symbols identifying the individual components are obscured if placed together as one unit.
- Each kit must be assigned a unique GTIN. In the event that a kit is sold but distributed in its component parts at separate times, care must be taken to ensure that only the GTIN associated with the kit is clearly displayed on each component and any GTINs identifying individual components are obscured.
- Any combinations of individual components that make up a kit must be uniquely identified with a separate GTIN.

Example:

Diagram 62: Exit Lighting Kit comprising four components all marked with a GTIN-13 represented in an EAN-13 Bar Code Symbol



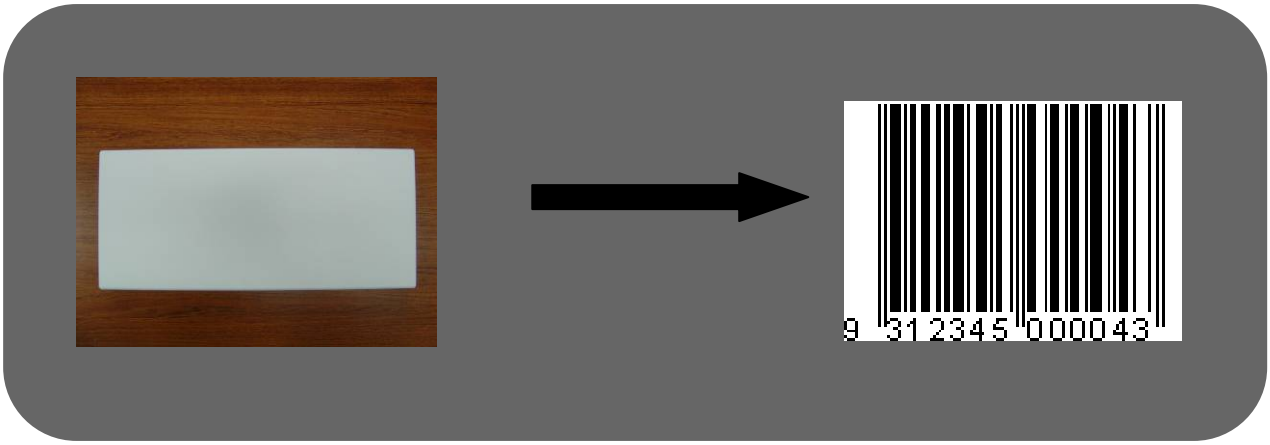
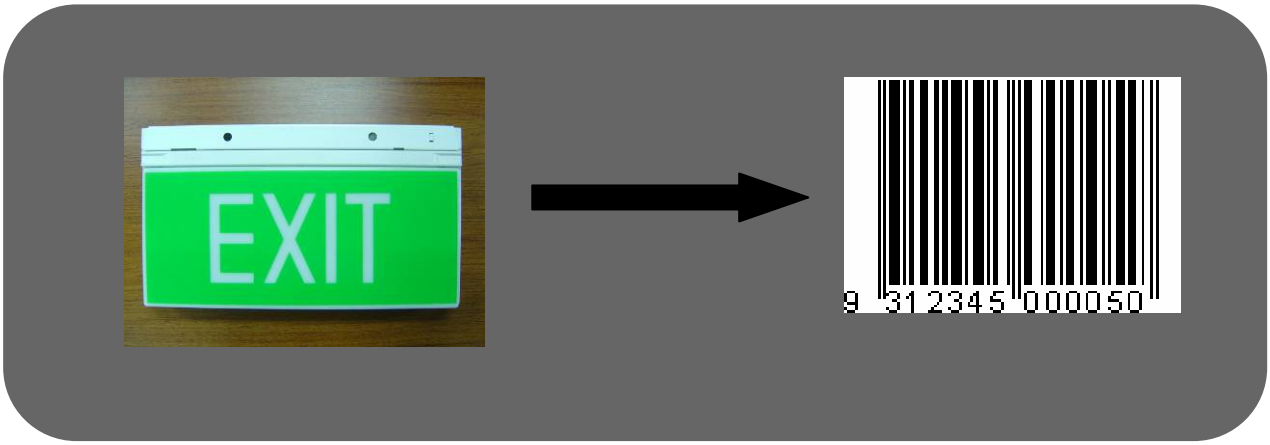


Diagram 63: Exit Lighting Kit bundled together marked with its own unique GTIN in the EAN-13 format



Following is another example of a trade item sold as individual components as well as a kit. As described above, each component would be assigned a unique GTIN with the kit assigned its own unique GTIN.

- Combination Outdoor Antenna Kit
  4 Components each with own GTIN:
  - VHF to UHF Antenna
  - Antenna Transformer Balun
  - 50 metres Coaxial Cable
  - Antenna Mounting U-Bolts & V-Bocks

Note: The above examples in no way depict every different type of trade item available; they serve only to provide real life examples.

Note: Please refer to Section 14.5.2 Trade Items Sold as Kits for discussion regarding the implementation issues surrounding the sale of kits in the Electrical Industry.

14.2.4 Variable Measure Trade Items NOT Sold at Retail Point-of-Sale (POS)

As described in Section 7.3 trade items may be variable measure either because the production process does not guarantee consistency in weight, size or length, etc, or because the items are created to meet a special order which states a quantity (e.g., cable sold by length).

The Electrical Industry recommends a variable measure GTIN be allocated to each variable measure non-retail item, as this enables the inclusion of an additional piece of data within the bar code symbol describing the variable characteristic of the item.

Within the Electrical Industry certain trade items fall within the above mentioned category. These include rolls of speaker wire, garden lighting cable, and electrical cable sold by length.

Note: This solution will not be available for trade items that are sold through a traditional retail Point-of-Sale environment as POS scanners are not set up to scan the GS1-128 Bar Code Symbol required for this application. Where retail sale is intended the options provided in paragraph 14.5.1 may be considered.

Diagram 64: 217 metre reel of electrical cable (length in metres)

14.2.5 Variable Measure Trade Items Sold at Retail Point-of-Sale (POS)

Within the Electrical Industry some trade items are sold at Point-of-Sale in variable quantities for example, electrical cable sold by the metre. Special consideration needs to be taken when identifying these products at Point-of-Sale and ensuring the amount sold is recorded correctly. Please refer to Section 14.5.1 for further details.

14.3 Attribute Information Options for Trade Items for the Electrical Industry

In “principle” the Australasian Hardware Industry supports the use of attribute data in the long term. Individual companies need to make their own assessment on the implementation and use of attribute data in their business.

Suppliers may wish to enhance the traceability of their own products by introducing additional information over and above the allocation of a GTIN to each trade item.

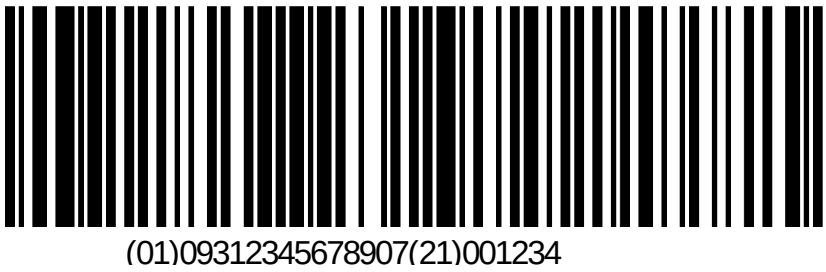
When attribute information is applied to a trade item that is sold at POS then it can be added along side the EAN-13 Bar Code Symbol, (see below) or encoded in a GS1 DataBar Bar Code Symbol if the systems that will record the scanning of the item and the resulting GTIN are suitably enabled. Detailed information about GS1 DataBar can be found in Section 6.3.

Where the trade item will not be sold at the retail POS attribute information can be concatenated (linked together) with the GTIN, in one single GS1-128 Bar Code Symbol as shown in Figure 23: Concatenated GS1-128 Bar Code Symbol, or in a GS1 DataBar Bar Code Symbol.

Figure 22: GTIN and serial number represented in separate bar code symbols

Note: The attribute information, in this example the serial number, represented in the above figure will NOT scan at the Point-of-Sale.

Figure 23: Concatenated GS1-128 Bar Code Symbol



Note: The bar code symbol represented in the above figure will not scan at the Point-of-Sale.

14.3.1 Application Identifiers Used in the Electrical Industry

The table below identifies some of the AIs that may be used by companies within the Electrical Industry.

It is recommended that suppliers/manufacturer/distributors consult GS1 regarding the use of these or any other Application Identifiers to ensure compliance to the standards at all times.

Note: Whilst the table listed below lists specific AIs that **may** be relevant for use within the Electrical Industry it does not preclude suppliers from accessing the entire list of AIs available for use. Refer to GS1 Australia's website (www.gs1au.org) under the download section for a complete list of list of AIs available.

			Format	
AI	**Notes**	**Content**	**AI**	**Data**
00		Identification of a logistic unit (SSCC)	n2	n18
01		Identification number (GTIN) of a trade item	n2	n14
02		Identification of trade items (GTIN) contained in a logistic unit	n2	n14
10		Batch or Lot Number	n2	an..20
11	a	Production Date (YYMMDD)	n2	n6
13	a	Packaging Date (YYMMDD)	n2	n6
15	a	Best Before Date (YYMMDD)	n2	n6
17	a	Expiration Date (YYMMDD)	n2	n6
20		Product Variant	n2	n2
21		Serial Number	n2	an..20
240		Additional product identification assigned by the manufacturer	n2	an..30
30		Variable Count	n2	n..8
37		Count of trade items contained in a logistic unit	n2	n..8
311	c	Length or first dimension, metres trade	n2	n6

a: when indicating only a year and month, fill DD with 00
c: indicates plus one digit for decimal point indication
n: indicates the field is of numeric format only, e.g., n2 indicates a numeric field of 2 characters
an: indicates the field is of alpha numeric format, e.g., an..2 indicates an alpha numeric field of up to 2 characters

14.3.2 Serial Number

The Application Identifier (21) is used to define a serial number.

A serial number is a unique alpha or alphanumeric number up to 20 characters in length assigned by a company to an entity for its lifetime. Combined with a GTIN the serial number uniquely identifies each individual trade item. Use any structure to generate the serial number. However, it must be possible for any company to use the combination GTIN and serial number for identifying a specific trade item, regardless of the actual structure of the number.

In the Electrical Industry, the traceability of high price products could be automated by applying the combination of the GTIN and the serial number to uniquely identify each and every unit.

Note: When used, the AI (21) must be associated with a GTIN

Figure 24: Serial Number AI (21) represented in a GS1-128 Bar Code Symbol

Note: When sold at retail Point-of-Sale the label affixed on the carton should represent the EAN-13 Bar Code Symbol format of the GTIN assigned with the serial number along side. (The GTIN assigned is the same just represented in a different bar code symbol type.) Alternatively GS1 DataBar Bar Code Symbol may be used provided the retail POS system that will process the sale of the item is suitably enabled.

14.4 Logistic Unit Marking for the Electrical Industry

The identification of standard and variable measure trade items is achieved by the allocation of unique GTIN's. The natural progression from the identification of a trade item is to the identification of a logistic unit.

As described in Section 8, a logistic unit is an item of any composition established for transport and/or storage, which need to be managed through the supply chain.

The use of the SSCC can enable the unique identification of every logistic unit. Within the Electrical sector logistics units could include reels of electrical cable, cartons of light fittings and switches, or pallets of air conditioning and heating units.

Example:

Diagram 65: Use of the SSCC on a logistics unit

Note: The SSCC would be represented on a label with a format depicted in Section 8.3.

There are also instances within the Electrical Industry where the allocation of a GTIN is not feasible because the resulting permutations and combination of product is limitless and is generally governed by the customer's order. In this case, an SSCC can be used.

14.5 Electrical Industry Implementation Issues

The implementation process often identifies anomalies that exist with certain product types where the standard application of the GS1 System is either not feasible or not practical. This in no way indicates that the system should not be used, but merely identifies that standard methodologies currently available do not fit within the scope of that particular product.

This section has been developed to assist the industry identify these trade items and methods of dealing with these trade items through the supply chain, including final retail Point-of-Sale.

14.5.1 Variable Measure Trade Items Sold at Retail Point-of-Sale (POS)

Within the Electrical Industry some trade items sold begin as standard items allocated a standard GTIN. For example, coils of wire. These items are traded as standard packs, for example 100m, 500m, and 5000m etc, all of which receive their own unique GTIN as described in Section 14.2.

This trade item can then be sold to the consumer in any number of variations of lengths generally as requested by the consumer at the point of purchase. It is important to note that once the fixed measure trade item has had a quantity removed the GTIN allocated to it at the point of manufacture no longer applies as the characteristic of the product has changed. As such the bar code symbol should be removed or defaced to avoid misrepresentation of the product.

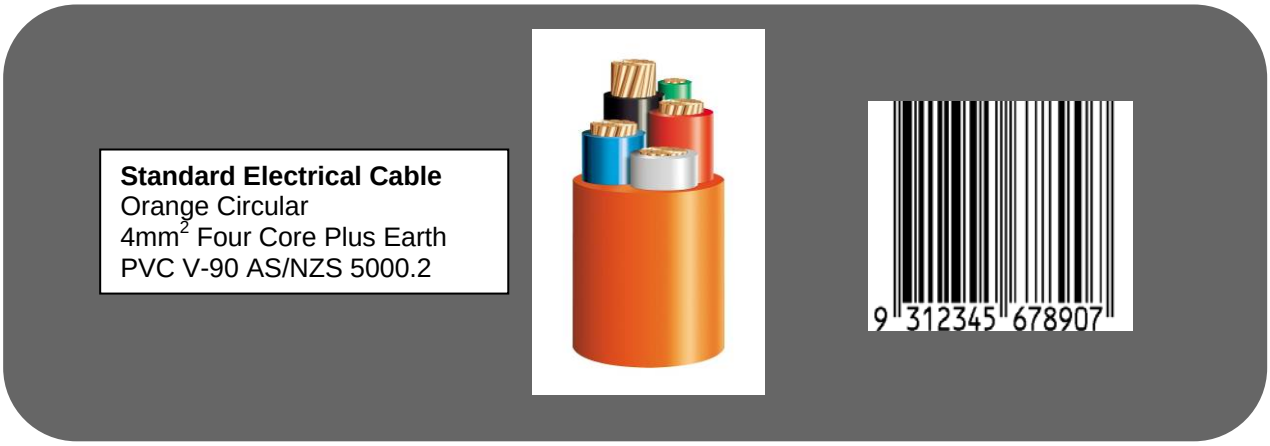
The following possible solutions are available to trading partners to enable automatic capture of the trade item, (generally required at the retail Point-of-Sale).

The supplier allocates (but does not mark the trade item) with a standard GTIN that identifies the trade item as **"cable type X variable measure"**. The cost per metre of the trade item would be entered into the database; much like the cost of a standard trade item is linked to the GTIN of a product. This assigned GTIN is represented by an EAN-13 Bar Code Symbol and printed in what is commonly called a shadow book[18] with an appropriate description along side. To aid identification, a picture or diagram of the item could also be included in the shadow book.

At the point of purchase the operator would scan the appropriate GTIN and the system would need to be programmed to prompt the operator for the total length purchased. From here the system calculates the price accordingly and registers the sale.

[18] A Shadow book is a book that contains the printed form of any GTIN's assigned but not printed on the actual trade item, generally because it is not physically possible to do so. The shadow book provides the operator the ability to quickly reference trade items sold and scans the appropriate bar code symbol. It provides an automated solution for the trade items not easily bar coded or have a variable component dictated by the customer.

Diagram 66: **Example "Shadow Book" entry for electrical cable sold by length**



1. The alternative to the above solution is that the seller (normally a retailer) of the trade item assigns a restricted distribution GTIN instead of the supplier and follows the same procedure as described above. Please consult the technical literature supplied by GS1 or contact GS1 Australia for further information about restricted distribution GTINs.

2. If the trade item will only be sold in set lengths from the coil, e.g., always in 1m sections, then each metre could be marked with its own unique GTIN allocated by the supplier. This then allows the operator at the POS to scan each bar code symbol identifying one single metre unit. This solution may require specific printing techniques and equipment and is only applicable if the length is set standard length blocks.

14.5.2 Trade Items Sold as Kits

In Section 14.2.3 the solution for the marking and distribution of trade items sold both as kits and individual components is provided. It is identified that in some instances the trade item, i.e., the kit, is sold as a complete unit but transported in its components, not necessarily all at the same time. In this situation, trading partners will need to confirm between them the best method of tracking all component parts to ensure that the complete set is ultimately delivered.

One method of doing this would be to identify via the GTINs allocated that the combination of all component GTINs is equivalent to the GTIN assigned to the entire kit. That is, a relationship would need to be created in the user's internal database linking the component GTINs to the overall kit GTIN. In this case upon receipt of the goods, the customer can scan the individual components and flag that only two of the three parts has been received. Once all components, in this example the third, are receipted the system updates the receipt of a complete kit.

For example:

The combination of all the components to form a double switch could be represented as:

9312345000012 + 9312345000029 + 9312345000036 + 9312345000043 + 9312345000050 = KIT GTIN

2 Gang Grid	=	9312345000012
Switch Mechanism (2 in above picture)	=	9312345000029
2 Gang Switch Facing Surround	=	9312345000036
Right Hand Switch Cover	=	9312345000043
Left Hand Switch Cover	=	9312345000050

Upon scanning the GTIN for the kit the system may request that the operator scan for each of the individual components to complete the receipt of the goods. Should one or more components be missing then this is flagged accordingly as an incomplete order.

This solution will require programming from within the IT department of each company. In addition information such as purchase order numbers and logistic unit marking may be required to ensure that there is unique identification of the original order and that in the event that only components are ordered and invoiced that this is not associated with the receipt of a kit.

Please consult with GS1 Australia for further assistance on this matter.

14.5.3 Retail Packs Opened for Individual Component Sale

Sometimes in retail outlets unit packs may be opened and the individual contents sold on a “per each basis”. An example would be a bag of 100 plaster clip brackets that is opened so one or more individual clips can be sold. In this example the pack itself would be identified and bar coded with a unique GTIN, but the individual clips would not be identified or bar coded. The following possible solutions are available to trading partners to enable automatic capture of the trade item, (generally required at the retail Point-of-Sale).

1. The supplier allocates the trade item grouping a standard GTIN-13 that identifies the trade items as **“Metal Plaster Clip Bracket; Variable Count”** (but does not mark the trade items). The cost per unit of the trade items would be entered into the database; much like the cost of a standard trade item is linked to the GTIN of a product. This assigned GTIN is represented by an EAN-13 Bar Code Symbol and printed in what is commonly called a shadow book[19] with an appropriate description along side.

[19] A Shadow book is a book that contains the printed form of any GTIN’s assigned but not printed on the actual trade item, generally because it is not physically possible to do so. The shadow book provides the operator the ability to quickly reference

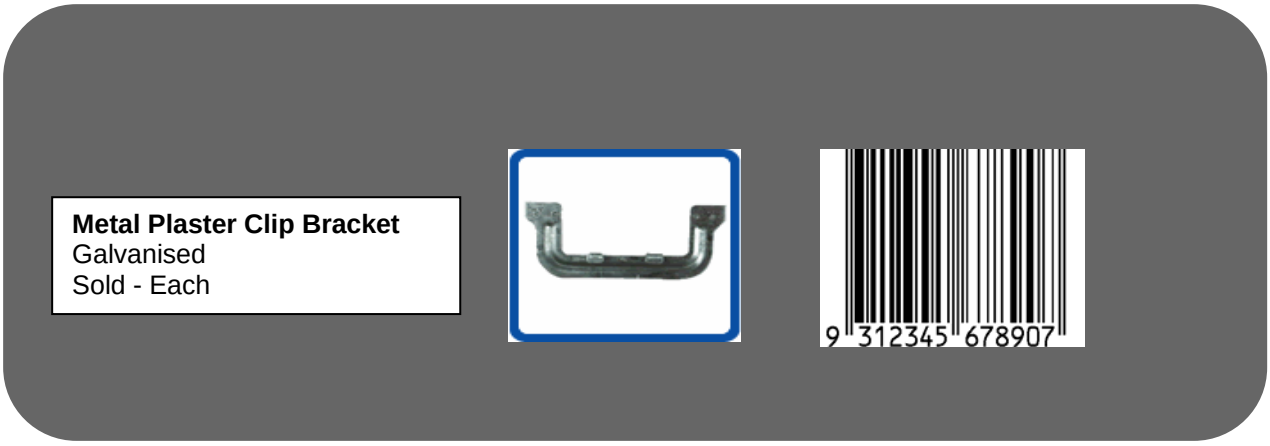
At the point of purchase the operator would scan the appropriate GTIN and the system would need to be programmed to prompt the operator for the total count purchased. From here the system calculates the price accordingly and registers the sale.

2. The supplier allocates the trade item a standard GTIN-14 that identifies the trade item as **"Metal Plaster Clip Bracket; Variable Count" and** would associate with it the count. This data would be concatenated (joined up) using Application Identifiers (01) and (30) and encoded in a GS1 DataBar Bar Code Symbol that would be printed and applied either to the piece or to an associated docket. .

   At the Point-of-Sale the operator would scan the GS1 DataBar Bar Code Symbol as in any other retail POS transaction. The POS system would capture the GTIN-14 identifying the item and the count data indicating how many items had been sold. Note that this option requires the scanner and POS computer system to be enabled for GS1 DataBar.

Below is an example of a shadow book entry for the purposes described above.

Diagram 67: Example "Shadow Book" entry for individual unit sale



1. An alternative to the above solution is that the retailer of the trade item assigns a restricted distribution GTIN and follows the same procedure described above. Please consult the technical literature supplied by GS1 or contact GS1 for further information about restricted distribution GTINs.

2. The supplier may choose to allocate a unique GTIN to the individual units within the pack and physically bar code these where appropriate. This then allows the operator at Point-of-Sale to scan each bar code symbol to identify the units sold. If this option is selected, it is recommended the user refer to the technical literature supplied by GS1 or contacts GS1 for further information about the GS1 technical standards for bar code symbol production.

trade items sold and scans the appropriate bar code symbol. It provides an automated solution for the trade items not easily bar coded or have a variable component dictated by the customer.

14.5.4 Customised Products

Customised Products, also called configurable products, are products manufactured to customer specifications that are not part of regular product offerings. Such products are often produced and sold by the Electrical Industry. For example, a manufacturer may offer double power points in the standard colours white, cream and beige. If a customer requires 200 double power points in blue, the manufacturer will produce and supply these.

The Electrical Industry requires the ability to trace these configurable products in a similar manner to standard products and as such is working with GS1 to define an industry standard for such traceability. This will be based on the existing capabilities of the GS1 System. Once the solution is finalised, these Guidelines will be updated.

14.5.5 Re-Use of Existing Product Packaging

Within the Electrical Industry there are instances where a customer may order a quantity of retail items that does not coincide with the total quantity of items packed within the standard non-retail unit. For example a customer may order 7 of a particular item, but the full quantity of the non-retail unit is 10. Currently, in this situation the supplier would remove 3 items and ship the remaining 7 in the existing packaging, leaving the existing bar code symbol. This would then introduce inaccuracies into the transaction as the customer, upon scan receiving the stock, would record the carton as containing 10 items, not the 7 still remaining.

In a situation as described above, the Electrical Industry in line with GS1 Standards recommends the following:

1. As soon as items are removed from non-retail unit, the bar code symbol on the packaging becomes invalid. This bar code symbol should be removed or defaced so as not to cause confusion for the customer scan receiving the stock.
2. The non-retail unit should then be bar coded with a variable measure GTIN combined with a count of the total number of retail items within the non-retail unit. This will then reflect the true contents of the non-retail unit. The bar code symbol placed on the non-retail unit will appear similar to that shown below.

Figure 25: Variable measure GTIN combined with a count of the number of items contained within the non-retail traded unit.

14.5.6 Imported Products

Sometimes non-retail units imported into Australia or New Zealand by the Electrical Industry do not carry GS1 bar code symbols. These products may carry non-GS1 bar code symbols or simply not carry a bar code symbol at all. The company receiving this stock does not usually break open the non-retail units and currently sends these to their customers with no modification to the packaging

Irrespective of whether the product does not carry a bar code symbol or carries a non-GS1 bar code symbol, the Electrical Industry recommends the following should occur:

1. The importer of the product should advise the brand owner of the Hardware Industry Guidelines and the requirement for non-retail trade items to be bar coded. The importer should also advise the brand owner that the GS1 Standards state GTINs allocated to non-retail trade items should be assigned by the brand owner, from their range of GTINs.
2. The importer should then request that the brand owner begins to allocate GTINs to their non-retail products and bar codes these as per the Hardware Industry Guidelines.
3. If the brand owner does not wish to bar code the products, the importer should ask this company to consider at least allocating GTINs to these products and advising the importer of these GTINs. It can then be the responsibility of the importer to bar code the product.
4. If the brand owner does not wish to allocate GTINs to their products, the importer can allocate a GTIN to the traded unit from their own range. However, if in the future the brand owner does allocate GTINs to their products, the importer must then change their GTIN allocations to be in line with that of the brand owner.

   Note: Using the method described in option 4, it is possible for multiple importers of a given product; operating within the one country, to all allocate GTINs to that product. This would create a situation where the trading partners operating in the industry would have to keep track of the multiple GTINs.

In addition, the Electrical Industry recommends that where a non-retail trade item carries a non-GS1 bar code symbol, this be either defaced or removed before the subsequent GS1 bar code symbol is placed on the packaging. Alternatively, the GS1 bar code symbol could be placed over the existing bar code symbol providing this is in line with bar code symbol location standards and does not impede the scanning efficiency of the uppermost bar code symbol.

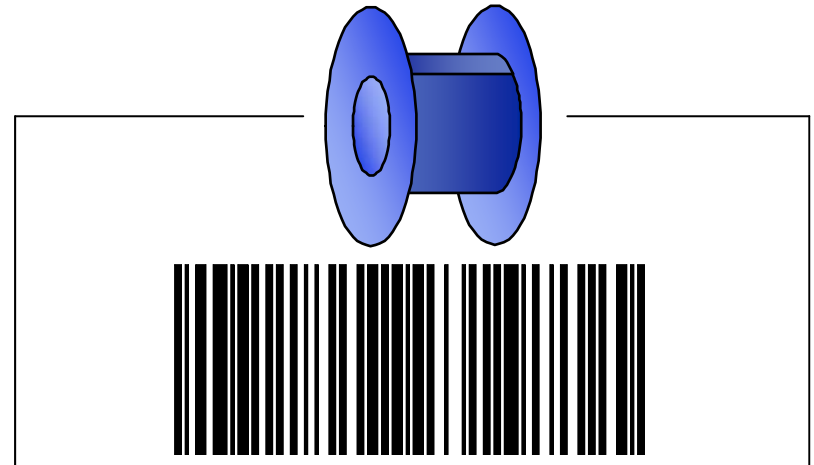
For further information about marking imported products with GTINs, please contact GS1, who can also provide contact details for GS1 in other countries for the information and convenience of overseas suppliers.

14.5.7 Fixed Length Cable from which a Variable Length is cut

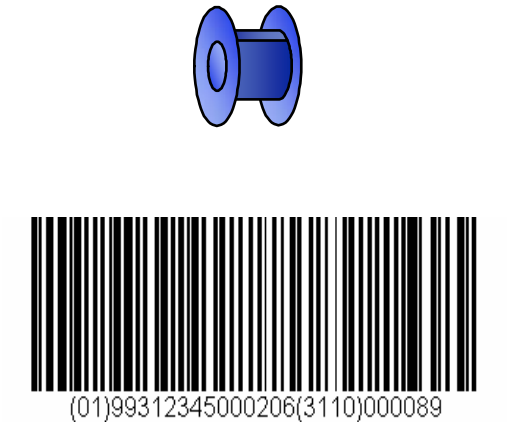
The majority of cable produced within the Electrical Industry is stored in fixed length reels, e.g., 5000m or 1000m that are not sold at Point-of-Sale. However, at the request of a trading partner, a specified quantity, e.g. 89m, may be cut off a fixed length reel and sold, again not at Point-of-Sale. As such, the bar code symbol on the fixed length reel then becomes invalid, as the reel is no longer the length to which the allocated GTIN originally applied. In this situation, the supplier will need to consider how they should then mark the reel with its remaining cable as well as the length of cable cut from the reel. Section 7 describes how to form GTINs for both fixed units and the resulting variable length pieces of cable; however Diagram 68 illustrates the format of both the numbers and bar code symbols to be used in the specific example described above.

Diagram 68: Bar coding fixed and variable length cable

5000m reel of cable (fixed length product)



Length of 89m is removed from 5000m reel (variable length product)



OR……

4911m of cable remains on original reel (variable length product)

OR……

15 Appendix

15.1 Bar Code Quality Check List

There are a number of aspects to printing the bar code symbol to ensure that 100% readability is achieved and maintained.

Ensure that:

- the correct GTIN is used for the relevant trade item. Confirm this number at artwork stage and after printing has occurred.
- the height of the bar code symbol is within the recommended ranges.
- the magnification is within the recommended ranges.
- the appropriate colours are chosen when printing the bar code symbol.
- the contrast of the bar code symbol is acceptable.
- the Quiet Zones that surround the bar code symbol are kept free from any graphics, borders or dark colours. A useful device to help maintain the Quiet Zone in some production processes is to include a “less than” (<) and/or “greater than” (>) character in the human-readable field aligned with the edge of the Quiet Zone. (Note: GS1 DataBar Bar Code Symbols do not require Quiet Zones but they are essential on all other types)
- the bar code symbol is kept clear from any seams or seals and that no distortion is caused by taping, shrink wrapping or excessive creasing of plastic over-wrap.
- the location of the bar code symbol on the final finished item is in line with the GS1 guidelines.
- the bar widths are not too wide or too narrow.
- that the bar code symbol will remain readable in the environment in which the item will be stored, handled and distributed
- the print quality is maintained throughout the print run.
- no bar code symbols will show through from the inner pack.
- on going regular checks are implemented to ensure quality is maintained.

Ensure that print quality is of the highest standard maintaining bar clarity and definition and ensuring that there are no print imperfections.

Some in-house printing methods, particularly on-line ink jet printing, require attention to the total print process and on-going maintenance.

The GS1 specifications for printing bar code symbols are explicit in that if the specified procedures are followed, with routine quality control, you can produce bar code symbols that scan consistently.

Note: It is recommended to get the quality of the bar code symbols assessed. This can be achieved through the use of the Bar Code Testing Service or becoming GS1 Accredited. Please refer to Section 15.4 for further information or contact GS1

15.2 Global Location Numbers (GLN)

15.2.1 Introduction

On a daily basis information related to parties and locations is generated and communicated throughout the business world in vast quantities. Names and addresses are put on envelopes for the mail, the point to which a delivery is to be made is put on transport documentation, EDI network addresses are provided in an EDI message, etc. These are just a few examples of the many applications in existence today, which identify parties or locations in trade or other communications.

With the advent of electronic communication, and particularly EDI, the need for the identification of parties and locations has become more acute. The use of numeric identification instead of full alphanumeric names and addresses is key to the successful implementation of an EDI project.

Global Location Numbers (GLN) offers an internationally recognised standard solution to the identification of parties and locations.

Once assigned at source, i.e. in general by the party owning the location, the GLN becomes a unique and universal reference, which can be used by all.

15.2.2 Definition of the Global Location Number (GLN)

The GLN is a 13-digit non-significant reference number used to identify:

- Legal entities, e.g. registered companies.
- Physical entities, e.g. a door of a warehouse, a particular room in a building.

Global Location Numbers (GLNs) can be used to identify anything, which is, or can be addressed. Some examples of this would include companies, rooms, factories, shelves, delivery points, EDI network addresses, etc.

Details associated with the GLN, e.g. name and address, location type, contact persons, communications numbers, banking information, delivery requirements or restrictions, etc., are stored in the computer files of the system users for later retrieval.

Although the GLN is strictly a reference key and does not carry any information on the location it identifies, it has a standard format and is structured to allow each GLN to be unambiguous and unique worldwide.

The format of a GLN is a 13-digit, fixed length numeric field, structured in the same way as a GTIN-13.

GLNs are mainly used in Electronic Data Interchange (EDI) to identify the sender and recipient of an electronic transmission and any party relevant to the transaction, e.g. buyer, seller, carrier etc.

GLNs can also be used in bar code symbol format to identify a physical location or to encode the identification of relevant parties in logistic applications, e.g. “ship to” location number. The GS1-128 Bar Code Symbol and the appropriate AI should be used according to the rules specified in the technical literature supplied by GS1.

GS1 member companies in Australia only that have been allocated a GS1 Company Prefix for item identification can use the same GS1 Company Prefix for assigning GLNs. New Zealand companies should contact GS1 New Zealand, who allocate GLNs for their members.

Companies that are not members of GS1 can still use GLNs. These companies should contact GS1 for further information.

15.2.3 Implementation Timing

- All companies should be identified by a Global Location Number (GLN) in all EDI messages.
- All locations (warehouse, stores, manufacturing plants, etc.) in EDI messages should be identified by Global Location Numbers.
- During a migration period, both Global Location Numbers and current internal numbers can be used at the discretion of the trading partners for identifying locations.

15.3 Emerging Technologies

15.3.1 GS1 DataBar™

As bar coding spread more deeply through the supply chain and more widely into new industry sectors, users were pressing for a number of years for bar coding technology that could be applied to very small items. In response to that demand GS1 has developed the GS1 DataBar Bar Code Symbol, known during its developmental stage as Reduced Space Symbology (RSS).

GS1 DataBar Symbols are designed for use on small items where conventional bar code symbols would be too large to fit. Many such items are in every day use, examples include; individual doses of medication in the pharmaceutical industry, small packaged food items in the grocery trade or all manner of everyday electrical goods which have become more sophisticated with a greater number of small, electronic parts.

GS1 DataBar is capable of encoding the 14 digit Global Trade Item Number (GTIN) and in some cases supplementary data such as weight, length, date and batch information. It is designed to bring the benefits of full product identification, as well as other supply chain applications, to space constrained situations where existing linear symbologies could not normally be used. GS1 DataBar Bar Code Symbols containing only a GTIN will occupy around forty per cent the space taken by existing EAN/UPC Bar Code Symbols printed at the same magnification and they may be vertically 'cut' into sections and presented stacked to meet space constraints. Once supplementary data are added the bar code symbols will become larger but they will still fit a given amount of data into much less space than the same data encoded in any other GS1 bar code symbol would occupy.

There are seven variants of GS1 DataBar and of these four are capable of use in the retail environment. GS1 has declared that GS1 DataBar will be a retail standard with effect from January 2010 but there is no reason why companies or sectors wishing to adopt the new standard could not do so earlier if they are willing and able to enable their POS systems for GS1 DataBar. Note that GS1 DataBar will not replace existing retail bar code symbol solutions but will become another option.

The technology to print GS1 DataBar already exists. All major American manufacturers of printing and scanning equipment have been aware of the development of GS1 DataBar and have been building the appropriate functionality into their products for several years so most equipment will be already capable or easily upgradeable. Generally it will be found that a printer capable of printing any EAN/UPC Bar Code Symbol will also be capable of printing GS1 DataBar.

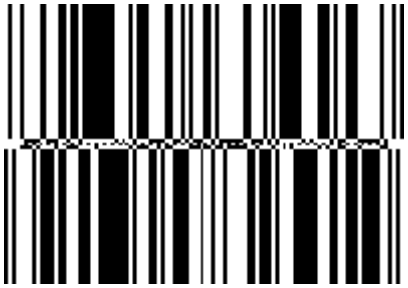
GS1 DataBar offers solutions to at least two of the Hardware Industry's longstanding problems, the automatic identification of items too small to carry a conventional bar code symbol, and items sold in variable quantities from rolls or packs that are delivered to retailers in standard configurations. It should be noted that the use of GS1 DataBar for variable measure items at POS cannot occur until the POS computer systems have the ability store 14 digit numbers.

Diagram 72: GS1 DataBar symbols capable of use at retail POS

GS1 DataBar Omnidirectional
(Encodes GTIN14 only)

GS1 DataBar Omnidirectional Stacked
(Encodes GTIN14 only)

GS1 DataBar Expanded
(GTIN-14 and supplementary data)



GS1 DataBar Expanded Stacked
(GTIN-14 and supplementary data)

Contact GS1 for further information about GS1 DataBar technical specifications.

15.3.2 EPC Network & Radio Frequency Identification (RFID)

Global trade involves moving goods and tracking them around the world. GS1 through their joint venture EPCglobal are rolling out and supporting adoption of the EPC network, which combines low cost RFID technology, existing communications network infrastructure and the Electronic Product Code (EPC). The EPC Network will make organisations more effective through real and timely visibility of information about items in the supply chain. The EPC network was developed by the Auto-ID Centre, a global research team directed through the Massachusetts Institute of Technology (MIT) and with labs around the world.

The EPC network incorporates global standardisation of tags and readers, a common method for describing objects Physical Markup Language (PML), middleware for the filtering and interpretation of data and an Object Naming Service (ONS) registry for locating the source of specific item information. Global standards have been developed with direct input from the GS1 community and end users.

The use of RFID technology has some advantages over bar code symbols in that it;

- Does not require line of sight
- Can read multiple items
- Some tags have read/write ability and have larger data storage capacity
- Some tags have additional functionality such as temperature monitoring

15.4 Services Offered by GS1 in Australia and New Zealand

15.4.1 Introduction

A new era demands new solutions. New solutions demand new services. That's why GS1 has invested heavily in a series of initiatives geared toward helping members successfully implement e-commerce based supply chain management strategies.

Through our specialised member assistance divisions: Member and Industry Support, Accreditation, GS1net and Professional Services, we are positioned to respond more efficiently to member needs.

By utilising these services as appropriate, you can gain greater control over your business and prepare for the future.

15.4.2 The Services

15.4.2.1 Member and Industry Support

The Member and Industry Support Team provides GS1's core service, enabling members to equip themselves with the knowledge needed to adopt the GS1 standards successfully.

Membership of GS1 allows the use of the GS1 standards for supply chain management and e-commerce processes. It also provides you, the member, with a wide range of assist services, which include education and training, information, industry guidelines, bar code symbol verification, advice on implementation and technical support.

In Australia these services include a basic training in the Supply Chain Knowledge Centre facility. GS1 Australia has created the ideal tool for demonstrating how supply chain management works, how it can be integrated into an existing business, and how training can help your organisation make the best possible use of resources - both human and physical.

The Supply Chain Knowledge Centre takes participants on an educational journey through the supply chain and is relevant to every sector of the economy. It demonstrates, in a clear and easily understandable manner, how sound supply chain management techniques can benefit your business and provide the foundation for current and future e-commerce strategies.

The Supply Chain Knowledge Centre is a very effective way to introduce staff to the fundamentals of supply chain management - from raw material, through manufacture, shipping and on to Point-of-Sale.

In New Zealand, GS1 New Zealand offers training and education to members through periodic seminars in the main centres and smaller centres on demand. From time to time seminars tailored to the needs of specific sectors such as the Hardware Industry will be provided at the request if the industry concerned, and customised on-site training is available on request.

GS1 New Zealand also offers the *Certificate in Automatic Data Capture Standards* a distance education course delivered through a combination of e-learning and traditional correspondence media. This self-paced course, that typically takes a total of forty to fifty hours to complete, leads to the award of two certificates, one from GS1 Global office in Brussels and one from GS1 New Zealand, and is recognised by the New Zealand Qualifications authority.

As a member in either country, you can call on the Member and Industry Support Team in Australia or New Zealand as an invaluable resource for achieving greater control over day-to-day supply chain processes and business transactions.

15.4.2.2 Accreditation

GS1 Australia and GS1 New Zealand offer an Accreditation Programme whose key role is to help companies with large product ranges makes substantial savings in administration and distribution costs. The Programme is a joint initiative originated by GS1 Australia and adopted by GS1 New Zealand. It is recognised in both countries and is being implemented by a growing number of other countries' GS1 organisations.

Administration and distribution cost savings can be achieved when companies meet the standards required to test their own bar code symbols, removing the need to continually submit new product samples to GS1 or for GS1 to provide bar code symbol verification reports to retailers. Savings can be considerable, but equally importantly, when the time involved in testing is reduced, new products can be brought to market with greater speed.

15.4.2.3 GS1net

Because integrity of data is crucial to e-commerce, EANnet was developed as a secure on-line data synchronisation catalogue, holding records of significant volumes of bar-coded items, including grocery, liquor, general merchandise, office products and much more. Each record contained a broad range of fields that include product identifiers, images, description, dimensions, barcode testing status, pricing and trading terms. In the course of GS1's ongoing modernisation and improvement of its offering EANnet is evolving into GS1net a new technological level of catalogue capable of interoperability with the growing number of similar catalogues in place or under development worldwide.

The catalogue meets the following needs:

- Allow all trading partners to synchronise data and remove errors associated with paper-based processes.
- Provide retailers and other industry stakeholders with an inexpensive means of accessing information on the total market.
- Provide a single point of entry and retrieval data repository, to enable data integrity that is essential to minimise errors in e-commerce transactions.

Notably, EANnet was officially endorsed from the outset by the Australasian retail grocery industry who now extend their recognition to GS1net.

15.4.2.4 Professional Services

The pressure to do business on-line is growing. For example, the Australian Government and many large corporations now mandate that suppliers deal on-line. When you need accurate and up-to-date e-commerce information and advice, GS1's Professional Services Team is ready to assist, by providing strategic help and guidance. We have positioned ourselves to provide professional consulting services covering all elements of the GS1 identification / bar coding system, supply chain management issues and of course, e-commerce

GS1's consultants offer a cost-effective and relevant means to come to terms with the processes and benefits these issues offer. Professional Services can help you with:

- Project Management / Facilitation
- Tailored training programs to help your organisations make the best possible use of existing systems.
- Compliance audits of internal processes, systems and applications to meet industry requirements.
- Implementation of standards based e-commerce solutions

Professional Services also offers expanded business solutions through our Alliance Partner network. GS1's Professional Services Advisors are experienced in all industry categories, including wholesale / retail, manufacturing, foodservices, meat, metals, building and agriculture. As a result, we can help to deliver complete end-to-end solutions by providing members with unbiased advice on hardware and software, facilitating implementation and training staff and management.

For more information on any of the above services, please contact GS1.