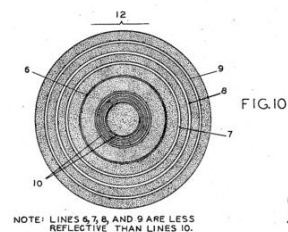
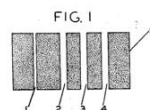


Coding creation and scanning

Presented by Bruce Botta

The 1st Barcode

Oct. 7, 1952 N. J. WOODLAND ET AL 2,612,994
CLASSIFYING APPARATUS AND METHOD
Filed Oct. 20, 1949 3 Sheets-Sheet 1



INVENTORS:
NORMAN J. WOODLAND
BERNARD SILVER
BY THEIR ATTORNEYS
Houston & Houston

The Evolution of Barcodes

- The barcode was patented in 1952 and was first commercially used in 1966 however it soon became apparent guidelines around its use would be needed. In 1973, industry leaders came together to create a single standard for product identification – the barcode. The EAN/UPC barcode is used more than any other barcode and is the ‘original’ barcode. This type of barcode has been used to identify millions of trade items (products and services) ever since.

- Recognised at any retail Point-of-Sale, EAN/UPC barcodes are scanned by omni-directional scanners. Meaning, they can be read right-side-up or upside-down by scanners – making them a quick and efficient barcode for high-volume scanning situations like supermarkets.
- In 1974 the first U.P.C scanner was installed and the first product to include a barcode was a packet of Wrigley's Chewing Gum. Today, barcodes capture an incredible amount of information about products and services which deliver benefits barely imagined 40 years ago.

- Barcodes are an essential part of the supply chain, having evolved from carrying a unique identifier of a particular product, trade item or object. These everyday barcodes whether they are 1d, 2d or 3d (in the form of GS1 2d data matrix barcode are the data carriers that are used across the globe to transform supply chain efficiency.
- Most of these data carriers can be scanned at any point in the supply chain to help identify, capture and share information about tradeable items, assets, logistic units, shipments, physical locations and more.
- There are a range of data carriers to suit different uses and applications. Each are designed to help improve supply chain efficiency and accuracy.

Types of EAN/UPC barcodes

- EAN – European Product Number
 - UPC – Universal Product Code
-
- The four most commonly used types of EAN/UPC barcodes in Australia

EAN-8

This encodes a GTIN-8, which is allocated directly by GS1 Australia.

EAN-8 barcodes are used to identify small items only.



EAN-13

This encodes a GTIN-13, and is used to identify the vast majority of trade items in the retail supply chain.

Examples of use: retail items that cross Point-of-Sale applications, everything from grocery items, products found in pharmacies and supermarkets and any retail outlet.



GS1 DataMatrix

The global healthcare sector has identified its use as its long-term preferred barcode.

These compact, two-dimensional barcodes hold a large amount of data in a relatively small space.



(01)09312345670000(10)ABC123

With the ability to capture up to 2,335 characters, a GS1 DataMatrix is used to identify very detailed product information, for example the specific parts of surgical instruments.

GS1 DataMatrix has in-built error correction, to compensate for lost or missing data, or damage to the barcode – making it very accurate and secure.

Some common uses include:

- Etching onto medical instruments
- Representing URLs on grocery products
- Has the ability to encode large amounts of variable or dynamic data (lot number, expiration date, serial number, etc.) at high production speeds
- Direct part marking (e.g. marking on surgical instruments, etc.)
- Efficient marking of irregular packaging for many medical products
- Global legal and regulatory requirements that dictate the placement of data in a bar code symbol
- Traceability requirements for both pharmaceuticals and medical devices

GS1 QR Code

GS1 QR Codes were recently introduced to provide another option for extended labelling, such as the representation of a URL with a GTIN on a product.

This can enable products to eliminate adding a printed leaflet reducing packaging which is better for our environment.






(01)09312345670000
(8200)http://example.com



(01)09312345670000
(8200)http://example.com

- Containing up to 4,296 characters, the GS1 QR Code is a two-dimensional square barcode that carries text-based data. It is designed to be read by specific scanners and smartphone apps.
- This barcode was introduced to support the representation of two specific GS1 Application Identifiers :
- AI (01) – this is the GTIN
- AI (8200) – this is an authorised URL
- Additional information can be encoded if needed, and the use of this barcode is also approved where GS1 has approved applications that support GS1 DataMatrix.
- The global healthcare industry currently only supports GS1 DataMatrix in their GS1 applications.

1D & 2D Barcodes

1D barcode example	2D barcode examples	
 <p>9 526000 134367</p>	 <p>(01)09526000134367 (17)301231 (10)ABC123</p>	 <p>https://www.example.com/01/09526000134367/10/ABC123</p>
EAN/UPC Product identifier only	GS1 DataMatrix Product identifier + more data	QR Code with GS1 Digital Link Product identifier + more data + web connectivity

Creating GTIN's Using the GS1 Check Digit Calculator.



GS1 Identification Numbers

Number type

Select ID key format



GTIN

Please select ID key fc

Check digit

Calculate

Clear

After signing up to GS1 Australia your company is assigned a GS1 prefix.

You can create barcodes by using the GS1 Check Digit Calculator. This is a simple tool that is available from GS1 Australia's website.

[Check digit calculator - GS1 Australia](#)

It generates the check digit (last number) of each barcode. In the case of an EAN 13 essentially the barcode contains two sets of numbers, an 8 digit global prefix that identifies your business, and a five digit product serial number that allows you to bring up a product's information by scanning the code.

GS1 Australia offer a service where a range of factors can be tested, including compliance to global standards, size, colour, print quality, numbering and more. Once tested, GS1 will provide you with a Barcode Verification Report indicating the compliance of your barcode and if necessary, any changes you may need to make.

For any product ranged in grocery it is essential the barcodes are verified by GS1 in order to be accepted by the major supermarket chains (Woolworths, Coles, Aldi & IGA).

As part of your Artwork Creation Standard Operating Procedure, you should keep a thorough and centralised database cataloguing the GTIN and which product it is assigned to. When assigning a new GTIN, verify that the new GTIN you are creating is unique against your existing GTIN's is highly recommended to ensure a GTIN is not used twice concurrently. If you use a GTIN, it is strongly recommended you do not re-use the number so as to avoid any resulting issues in the supply chain. Indeed, you cannot re-use a regulated healthcare barcode.

The size and placement of the barcodes is critical, GS1 have published guidelines for size, magnification and colour for both units and trade units (shelf ready trays, inner labels, shippers and pallets). In order to ensure smooth sailing in the supply chain it is strongly recommended GS1 guidelines are followed, especially in the Grocery Channel.

- Using GTIN's (particularly 2D datamatrix's) enables us to not only improve supply chain efficiencies, but to be able to track and trace products at various points of the supply chain. In the Pharmaceutical Industry, this is especially important for the following reasons.
- GTIN's provide the ability to comply with regulatory requirements and guidance on recalls
- Efficient & effective logistics management
- Reduces business risks above and beyond legal compliance
- Product authentication and anti-counterfeit measures
- Brand protection

2D data matrix barcodes & TGO 106

We will see an increased take up of GS1 data matrix barcodes in the Australian Pharmaceutical Industry if the adoption of this technology in other parts of the world is anything to go by. Many overseas Pharmaceuticals markets in North America, Asia and the Middle East already use 2D data matrix barcodes successfully and indeed here in Australia the TGA have announced the introduction of TGO 106 which comes into effect in January 2023 and sees the Australian Pharmaceuticals industry coming into line with other world markets.

TGO 106 is designed to put in place minimum technical requirements to ensure the effectiveness and functionality of serialisation and data matrix codes, where sponsors intend to use such technology for medicines supplied in Australia, without mandating the use of such technology in Australia at this stage.

In doing so, the Order will support the safe use and timely availability of medicines in Australia for which such technology is utilised.

Having the ability to record substantial amounts of key data and being able to see in real time is a significant asset to any manufacturer/product owner and the benefits of improved traceability must be viewed as invaluable.

GS1 Australia are always happy to assist with any queries surrounding assigning GTIN's and have excellent resources available particularly for the Healthcare Industry.

Pharmacodes and their use in the Pharmaceutical Industry



Pharmacode (also known as the Laetus code) is a binary code that is used in the pharmaceutical industry as a packing control system.

It has **single-track** and **double-track** varieties and there are **regular** and **mini** options.

The two main types of Pharmacodes



Regular Pharmacode



Mini Pharmacode

- At Aspen Australia we use pharmacodes on printed packaging such as unit cartons, labels, label/leaflets, leaflets and some foils. Pharmacodes match and validate all of the component parts of a package to ensure that the right product, with all of its required documentation, goes into the right package. Pharmacodes are only used for internal tracking. Each of our production lines have pharmacode readers that scan the pharmacode ensuring correct packaging is used.

At Aspen Australia we maintain a spreadsheet of all the pharmacodes in use and when a new packaging item is raised an appropriate number is then identified and assigned to the packaging item.

Once assigned we lock the number away so it cannot be used for another packaging item so eliminate any duplications or wrong packaging being used in manufacture.

Our Standard Operating Procedure requires me to check if the pharmacode is available – check against the Pharmacode Register and also enter the number into our Packaging Specification program to ensure the number is unique.

A 2nd person also conducts the check to minimise human error.

Once the packaging item has been obsoleted from use the packaging item recorded against the number is obsoleted and the pharmacode number is made available for future use.

Graphic Designers have a number of software options available to create the actual barcodes and pharmacodes, it is always highly recommended the barcodes are produced to meet GS1 Australia's guidelines and the pharmacodes be sized to Laetus standards in order to ensure optimal scanning and minimal disruptions in any scanning environment. When applying a pharmacode to artwork, quiet areas to the left and right of the pharmacode must be maintained in order for the production line's pharmacode reader to scan the code unimpeded. The size of the thin and thick bars also needs to be maintained for the same reason. A barcode creation software program like Agamilk produces compliant barcodes and pharmacodes and is an invaluable tool for us.