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Basic Guide to Product Barcodes

USING BARCODES FOR EXPORTS TO THE US

What are product barcodes and what purpose do they serve?

Barcodes are machine readable graphic symbols combined with a byline of equivalent numbers, that are used to encode an identification number relating to a product, and which can then be scanned electronically. Today barcodes are an essential requirement in many areas of business and logistics, and are generally a minimum requirement for products that are put up for retail sale. Barcodes, such as the 12 and 13-digit formats commonly used for retail purposes around the world, were developed in the 1970s to make business processes more efficient, and have been in common use ever since.

Barcodes are today managed primarily through a global organisation called **GS1**, which resulted from a co-operation agreement between the original United States barcode authority (Uniform Code Council - **UCC**) and the European Article Numbering Association (**EAN**). While GS1 is the recognized industry authority, barcodes can also be acquired through an extensive reseller network (different options and implications are discussed overleaf).

Visually, barcodes are constructed in various formats, according to their type-specific standard. 1-dimensional barcodes comprise a collection of parallel vertical black bars, of different thicknesses and spacing, and placed on a contrasting white or light-coloured background.

These graphical images are machine-readable by scanners and some smartphone apps, and integrate into the logistics chain right up to point of sales (PoS) systems in retail outlets. The vertical lines correspond to a series of numbers that are placed beneath the bars.

Scanners that capture a barcode usually transmit the information from a barcode to a host computer, where it is matched to any information associated with the barcode in real time, allowing for efficient business processes (sales, stock management etc.).

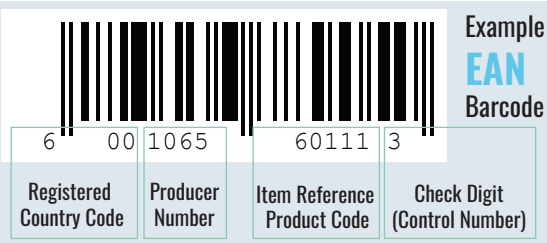
Barcodes can contain important information about a product, allows information to be linked to a business' sales and stock systems; this ensures for example that correct prices are displayed and inventory is updated. Some barcodes link back to registered owner details.

- Different types of barcode systems are used in the retail sector. The most commonly used product-specific barcodes are the Universal Product Code (**UPC barcode**) and the European Article Number (**EAN**), now also known as the International Article Number. These are 1-dimensional codes, unlike 2-dimensional codes (such as the QR codes used on Page 2 of this Guide, which can be used to hold other information, such as web site addresses, street locations, wifi credentials video links, app store details, and so on).
- The UPC barcode is the original barcode developed in the U.S. for the North American market , while the EAN was initially developed for the European market, and subsequently expanded globally.
- The graphic part of the two codes looks the same and can be read by the same scanners, since the placement, spacing and thickness of the vertical bars match. However, while the UPC barcode comprises 12 digits beneath the vertical bars, the EAN barcode contains 13 digits, with slightly different spacing and meaning.
- While both the UPC and EAN incorporate a country code, this does not provide a proof or indication of a **product's** origin; rather, it is an indicator of the country where the code was originally issued. This is due to various reasons: (a) barcodes form part of an international system and there is no direct link to the location of the applicant or product's production, (b) barcodes were previously issued without the need to pay annual renewal fees, giving rise to the current reseller industry, (c) where company registrations are linked to a database, such barcode prefixes relate to the company's location, and not necessarily the place of production.
- Essenially, country codes relate to the issuing authority where they are sourced, rather than the origin of a product.

Anatomy of a barcode

Both the **UPC** and **EAN** format codes contain similar elements, with the numbers being the numerical equivalent of the graphic part, which is machine-readable. The numbers also include a check digit at the end, based on a mathematical algorithm, in order to verify the numerical sequencing, and to ensure that no mistake is made when inputing the number into a system manually.

While **EAN** barcodes use a specific country identifyer (the **UPC** code begins with a 0 and is by default attributed to the United States and Canada), this is not proof of a product's production location and origin, as explained in the column alongside.



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Obtaining a barcode: What are the options?

Producers or exporters intending to sell their products through retailers or third party trading platforms will be expected to obtain a unique barcode for each of their products. These barcodes play an important role in the selling process, can help manage stock levels, increase overall efficiency and assist with traceability.

In choosing how to obtain barcodes, the producer should consider any special requirements that may be relevant to or even imposed by the buyer (for example the U.S. importer), and the retail or trading platform through which the goods will eventually be sold. While for most sales and distribution channels any unique barcode will work and be acceptable, others require that a barcode incorporates the producer's registration details in a central database, which is only possible when the barcode applicant is assigned its own unique company prefix through GS1.

Although both **UPC** and **EAN** barcodes use the same symbology from a graphics, machine-reading perspective (meaning that visually they look the same albeit that different numbering formats apply), the **UPC** is the dominant barcode format used in the U.S. while **EAN** barcodes are more common in the rest of the world.

Barcodes in different formats are widely available both from official bodies and a large number of resellers, and after processing can typically be downloaded from the online websites of the respective sellers. See the table below and the text alongside for more information on these two options.

Barcodes from online resellers

Barcodes (UPC, EAN and other formats) can be sourced from numerous online resellers.

- Barcodes tend to be inexpensive, and are one-off puchases without any recurring fees
- Usually instantly available to the applicant as a download from the reseller sites, or available within a very short period of time
- Although unused and fully functional, these are often pre-registered to an original third party and sourced prior to annual renewal fees becoming applicable
- Sometimes accompanied by a certificate of authenticity and exclusivity from the reseller
- Generally no company-specific prefix of the buyer (applicant) available on recognized global database

Barcodes from GS1

GS1 is the official global registrar and issuing authority of barcodes and maintains its global barcode database.

- Barcodes are more expensive, and subject to a registration and annual renewal fee
- Application and processing usually takes longer than purchasing "off the shelf" from resellers
- Applicants can obtain a unique company prefix and manage barcodes within this series of codes
- Applicants' company prefix details are entered in a global GSI barcode database
- Some retailers and platforms (such as Amazon) require barcodes that are registered with the product owner's details on the GS1 database

Sourcing barcodes via resellers or through official channels

- Applicants have the option of purchasing barcodes either through dedicated barcode resellers, or directly through the barcode registration authority. While both may seem feasible options, there are important differences that applicants should be aware of. It is also of vital importance to consider any requirements imposed by specific retailers or trading platforms.
- Barcode resellers tend to sell "off-the-shelf" barcodes that have either been bought in bulk by the reseller previously (prior to annual renewal fees becoming applicable), or have been generated based on registered company prefixes where unused surplus barcodes are available, or acquired from other sources. These barcodes tend to be offered for sale at low cost, and are usually immediately available for download and use. While there are some risks associated with this option, there are many reputable resellers selling unused and unique barcodes that work well for most use-cases.
- Some major retailers in the U.S. such as Wal-Mart, and online platforms like Amazon, have their own barcode requirements. This often includes compelling the use of **UPC barcodes** that are registered to the producer or seller of the product, and whose details are entered (and can be verified) in a global barcode database.
- This requires barcode applications to be done through the global barcode authority **GS1**, as this allows a unique company prefix to be assigned and registered, and barcodes linked to the applicant added to the system. GS1 barcodes require an annual renewal fees, as well as recurring fees based on the number of barcodes required.

Sourcing barcodes: How many do I need?

Barcodes contain distinguishing information about your product's key defining characteristics, which means that each product variation requires its own unique barcode. Distinguishing features would typically include different packet sizes (weight or volume), different design characteristics, colour, or other key features.

Ultimately, the purpose of this is to ensure that each product's sales transactions (for example through point-of-sales systems), inventory management and ordering process can be undertaken in a differentiated manner.

Illustrative example

A producer of coffee sources beans from **Uganda** and **Tanzania** and offers both as single origin coffees, in **250g** and **1kg** size packaging, both as whole **beans**, or **ground**.

8 barcodes will be required. If blended coffee (beans and ground) is offered too, then a further 4 barcodes would be required.

Other things to note

Application and print standards

Barcodes must be printed in high-quality so that barcode scanners can reliably read them. This requires sufficient contrast between the black vertical lines and the background, which should either be white or a light colour. The GS1 standard size for a UPC barcode is set at 1.46" x 1.02" (approximately 37.3mm x 25.9mm), but printing size may span 80-200% of this standard. There should also be an adequate "quiet zone" around the barcode (white/light background colour), to ensure accurate reading by scanners.

Choice of barcode (UPC / EAN)

The choice of suitable barcode for general products remains the prerogative of the applicant. If focusing on the U.S. market, the UPC barcode is the preferred standard, and a definite requirement by some retailers.

Retailer / Buyer requirements

Always check whether the international buyer of your product has specific barcode requirements, to ensure full acceptance.

Useful web resources

SCAN CODE

GS1 Barcodes (United States site)
bit.ly/GS1-USA

GS1 Guide to Barcode Implementation
bit.ly/GS1-barcode-guide

GS1 Global Barcode Information Registry
bit.ly/GS1-GEPIR

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