

GS1 Barcode Check

Barcode Characteristics

Fact Sheet



Barcode Characteristics Fact Sheet

When printing barcodes, there are various considerations to ensure the symbol is of sufficient quality to ensure consistent scanning.

Magnification (X-dimension)

The allowable magnification (X-dimension) range depends on the symbol type and the intended scanning environment. Reliability of scanning is always enhanced by selecting a magnification (X-dimension) higher than the minimum.

Your printer may recommend a magnification larger than the minimum allowable. This should not be taken as a reflection on the quality of your printer. To print an accurate and high quality barcode a number of factors, such as the printing process, ink quality, and substrate, must be taken into consideration.

The artwork designer must work closely with the printer to ensure that the space allowed for the barcode is sufficient. The designer will not be able to decide on the area required for the symbol prior to consultation with the printer.

Barcode Size Gauges can be obtained from GS1 Australia to be used as a guide to show the sizes of various symbol types at different magnifications. The Size Gauges are not intended to be a precise measuring tool, but can be a handy tool during the artwork stage to determine the amount of space needed for the required/chosen magnification.

Bar Height

Once the magnification (X-dimension) of the barcode has been determined, for EAN/UPC Barcodes it is important to ensure that the height remains in proportion to the magnification, and does not drop below the minimum specified.

For ITF-14 and GS1-128 Barcodes the magnification (X-dimension) does not impact the height, rather the height is determined by the scanning environment.

Please note that truncation (height reduction) on any symbol will reduce scanning reliability, and where space permits the full height should always be printed.

Quiet Zones

The Quiet Zones of the barcode are the solid, light areas before the first bar and after the last bar. These areas are extremely important as they allow the scanner to recognise the beginning and end of the barcode. Any obstruction or reduction in the Quiet Zones will most likely result in scanning difficulties.

The minimum size required for the Quiet Zones depends on the magnification (X-dimension) of the barcode. It is recommended to allow slightly more than the minimum required Quiet Zones to allow for any possible ink spread or plate registration issues.

For EAN/UPC Barcodes 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 Interpretation field, with its apex aligned with the edge of the Quiet Zone.

Substrate

The substrate (the material the barcode is printed on) is very important. If unsuitable this can cause scanning difficulties. Different packaging materials reflect light differently, which can have an effect on the scanning ability of the barcode. This is especially evident on transparent and translucent packages where the background is not printed.

For printing barcodes it is recommended that you avoid the following:

- High gloss (highly specularly reflecting) substrates
- Transparent or semi-transparent backgrounds
- Transparent wrappers over the printed barcode

If necessary to print onto a highly reflective (flexible) substrate, we recommend the following:

- Increase the magnification (X-dimension) of the barcode to between 105% and 120% (X-dimension 0.35mm - 0.40mm)
- Increase the amount of Bar Width Reduction
- Make the background of the symbol as dense and less reflective as possible. To do this you may try the following:
 - If you are not using wet inks, print two background layers. This may be two layers of the one colour, or you may use all light colours in the print run (e.g. white and yellow)
 - Use a less viscous ink that will provide maximum coverage and density

Bar Widths and Print Quality

Always ensure that the print quality of the barcode is of a high standard. Ensure that the bars in the symbol are clearly defined, watch for voids or smudging, and avoid flecks in the background colour.

Maintaining acceptable print quality and consistent print gain (ink spread) requires regular ongoing checks.

Colours

The colours and type of ink you choose for your barcodes is very important.

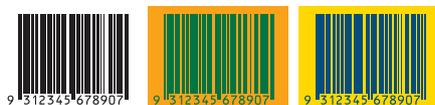
As a scanner reads a barcode using an infrared light source it sees the symbol differently to the human eye. As a result, some colour combinations and ink types are unsuitable for scanning because they do not provide sufficient contrast between the dark bars and the light background, or they provide a much too high reflectance value.

The most suitable and reliable colour combination is black bars on a white background. However, as a general rule, the background of the barcode can be a light, warm colour that does not contain any black (such as yellow or light orange), and the bar colour can be a dark, cool colour that has no, or low, red content (such as dark blue or dark green). It is also a recommendation to avoid high gloss inks as this can cause problems with the reflectance values.

Consult your printer or GS1 Australia if you are uncertain about colour choice/options.

The following colour chart shows a few examples of suitable and unsuitable colour combinations.

SCANNABLE Barcodes



NON-SCANNABLE Barcodes



Figure 1: Colour Chart

Checklist for Generating and Printing Barcodes

Below is a quick checklist of things to check during the barcode generation and printing processes. They represent common errors/problems seen by GS1 Australia.

- Ensure that the correct symbol is used for the relevant product, application, and scanning environment
- Check that the barcode will remain readable in the environment in which the product will be stored, handled, and distributed
- Ensure that the Check Digit is correct
- Check the size of the barcode, both the magnification (X-dimension) and the bar height
- Ensure that there are adequate Quiet Zones, and that any optional Quiet Zone Indicators are correctly placed
- Check that the contrast between the bars and the background is adequate, and that the colours chosen will scan
- Make sure that the colour of the contents of the packaging will not unduly affect the contrast between the bars and spaces
- Check the position of the symbol on the final, formed product
- Ensure that no shrink-wrap, tape, or other printing will obscure the barcode on the finished product
- Ensure that no other barcodes will be visible or show through from the inside of the pack
- Carry out routine verification at all levels of packaging to ensure that the barcode complies with the required quality standard, and to identify any potential problems
- Check the print quality regularly throughout the print run by verifying the barcode quality
- Notify trading partners of the GTINs and the products they identify in good time
- Consider having GS1 Australia prepare a Barcode Verification Report on the artwork for you prior to the final print to help detect any errors or areas for improvement

About GS1 Australia

GS1 Australia is the leading provider of standards and solutions for over 20 industry sectors. We introduced barcoding to Australia in 1979 and today we enable more than 17,000 member companies, of all sizes, to become more efficient by implementing the GS1 system.

We bring businesses, associations and industries together. This blended community comes to GS1 Australia for advice, networking and solutions to their supply chain challenges.

We partner with, and help showcase, members, solution providers and industry leaders to demonstrate and encourage supply chain best practice.

We offer a range of value adding services that support our members through their journey including consulting, solution selection and compliance.

GS1 Australia makes a real and tangible difference to businesses. We are integral to your supply chain success.

GS1 Australia

Head Office, 8 Nexus Court, Mulgrave VIC 3170
Locked Bag 2, Mt Waverley VIC 3149
T 1300 227 263 | **F** +61 3 9558 9551 | **ABN** 67 005 529 920
www.gs1au.org

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