ITF-14 barcode
Fact Sheet

The ITF-14 barcode is used to encode a GTIN-14, a GTIN-13 or a GTIN-12. It is intended for scanning in a General Distribution Scanning environment only. Ideal for printing directly onto corrugated cardboard cartons.

Note: An ITF-14 barcode encodes a fixed length data string of 14 digits. Therefore, when encoding a GTIN-13 or GTIN-12 in an ITF-14 barcode, one or two filler zero(s) respectively must be added in front of the GTIN.

Figure 1: Measurements of a GTIN-13 with a filler zero encoded in an ITF-14 barcode at an X-dimension of 1.02 mm

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Note: Figure is not to scale. Measurements are in millimetres.

Bearer bars

Bearer bars are bars abutting the tops and bottom of the symbol bars in a barcode, or a frame surrounding the entire symbol. The purpose of the bearer bar is:

- To equalise the pressure exerted by the printing plate over the entire surface of the barcode.
- To enhance the reading reliability assisting in the reduction of the probability of misreads or short scans which may occur when a skewed scanning beam enters or exits the barcode through the top or bottom edge.
- To possibly provide a visible check that all the print head elements are working if using a thermal print process.

Figure 2: Example of a Skewed Scanning Beam

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Note: Figure is not to scale. Measurements are in millimetres.

The top and bottom bearer bars are mandatory unless it is not technically feasible to apply it, in which case reading reliability is reduced. The vertical bearer bars are optional when using printing methods not requiring printing plates.

For printing methods requiring printing plates, the nominal bearer bar has a constant thickness of 4.8mm and must completely surround the barcode, including its Quiet Zones and butt directly against the top and bottom of the symbol bars.

For printing methods that do not require printing plates, the bearer bar only needs to be applied to the top and bottom of the barcode butting directly against the top and bottom of the symbol bars. The bearer bar may extend above and below the Quiet Zones. Make the bearer bar a minimum of two times the X-dimension (width of the narrow bar), which at X-dimension of 1.02mm (100% magnification) is:

X-dimension x 2 = 1.02 x 2 = 2.04 mm.

Magnification (X-dimension)

The specified magnification (X-dimension) range for ITF-14 barcodes that are to be scanned in a General Distribution (automated) Scanning environment is between 48.7% and 100% (X-dimension 0.495mm – 1.02mm). For other scanning environments the allowable magnification range is between 25% and 48.7% (X-dimension 0.250mm and 0.495mm).

For all scanning environments printing at the higher end of the magnification range is recommended.

Regardless of the scanning environment, ITF-14 barcodes with a magnification less than 62.5% (X-dimension 0.64mm) should not be printed directly onto corrugate fibreboard.

Mathematically, when W is width, 48 is the total number of narrow elements, 29 is total the number of wide elements, BWR is the Bar Width Ratio which is nominally 2.5, and X is X-dimension (module width), which is 1.02mm at 100% magnification.

W = (48X) + (29X) BWR (excluding Quiet Zones and Bearer Bars)

Height of Bars

For scanning in a General Distribution (automated) Scanning environment, the minimum recommended bar height for an ITF-14 barcode is 32mm.

For all other scanning environments, the bar height should be printed as high as possible. In no case shall the bar height be less than 13mm. While 13mm is the minimum height for barcodes not being scanned in an automated scanning environment, every effort should be made to increase the bar height to as close to 32mm as possible.

Human Readable Interpretation

The HRI should be placed below the barcode, must show all digits encoded in the barcode and be grouped together wherever physically possible.

A clearly legible font shall be used, e.g. OCR-B. This typeface is a recommendation only and alternative type fonts and character sizes are acceptable provided the digits are clearly legible.

Bar Width Ratio

Bar width ratio is the comparison in bar widths between the wide modules and the narrow modules in an ITF-14 barcode.

The target bar width ratio is 2.5:1, meaning that the wide bars are 2.5 times the width of the narrow bars.

While the preferred bar with ratio is 2:5:1, the acceptable range us 2.25:1 to 3:1.

Table 1: ITF-14 barcode dimensions

Magnification	X-dimension	Width	Bar Height	Quiet Zones
25%	0.25	30.62	13.00	2.54
30%	0.30	36.73	13.00	3.05
35%	0.36	42.85	13.00	3.56
40%	0.41	48.97	13.00	4.06
45%	0.46	55.09	13.00	4.57
50%	0.51	61.21	32.00	5.08
55%	0.56	67.34	32.00	5.59
60%	0.61	73.46	32.00	6.10
62.5%	0.64	76.52	32.00	6.35
65%	0.66	79.58	32.00	6.60
70%	0.71	85.70	32.00	7.11
75%	0.76	91.82	32.00	7.62
80%	0.81	97.94	32.00	8.13
85%	0.86	104.06	32.00	8.64
90%	0.91	110.19	32.00	9.14
95%	0.97	116.31	32.00	9.65
100%	1.02	122.43	32.00	10.16

Notes:

- Width = width of barcode excluding Quiet Zones and bearer bars and assumes a Bar Width Ratio of 2.5:1
- Bar Height = bar height excluding bearer bars.
- It is recommended to always allow slightly more than the minimum required Quiet Zone to allow for any possible ink spread or registration issues.
- All measurements are in millimetres correct to two decimal places.