



Barcode Verification: What it means to you

Poor quality bar codes can cost retailer's time, money and goodwill from their customers. This is why many of them request GS1 verification. The verification reports indicate the scan rate achieved by the bar code sample with a standard verifier, plus attributes such as bar height, print contrast and whether the symbol complies with GS1 specifications.

A retailer may choose to reject products or require re-labelling whenever a verification report contains any negative comment – even if the reported scan rate is 100%. This can add costs to manufacturing processes and manufacturers can avoid these unnecessary costs by producing bar codes right first time. They can also encourage their suppliers to do the same. GS1 advises members to send bar code samples for verification testing regularly, and to remedy any shortcoming disclosed by the tests. GS1 aims to add value to members by helping achieve excellence in supply chains and also avoid any costly errors such as barcodes that do not scan. Perfect bar codes are crucial to a company's success.

The technical stuff!

Verification of bar code symbols as specified by the EAN.UCC General Specifications is based on ISO/IEC Standard 15416, published in 2000 and generally known as "the ISO Standard". This is compatible with the earlier American Standard ANSI X3.182 ("the ANSI Standard"), so users of equipment compliant with that standard may continue to use it to meet the requirements of the EAN.UCC General Specifications. Testing must be conducted with a verifier that complies with those standards.

To verify bar codes in accordance with the ISO standard, ten separate scans are taken. Each scan must be taken evenly across the bar code symbol and measure all the parameters described below.

Each scan is given a **scan grade**, which equals the lowest grade received for any of those parameters. The overall **symbol grade** is then the numerical average of the ten scan grades. These range from A to F. Under EAN.UCC General Specifications, an overall symbol grade of "C" (1.5) is required for a bar code to pass verification. The exception is an ITF-14 bar code with a magnification greater than 62.5% in this case, an overall symbol grade of "D" (0.5) is acceptable.

Should an ITF-14 be printed directly onto a label at a 50% magnification then the minimum pass grade is a "C".

There are seven parameters that are assessed for each scan. These parameters are known as: decode; symbol contrast; minimum reflectance; edge contrast; modulation; defects; and decodability.

Decode

What this measures: whether or not the verifier can decode a symbol (including its guard patterns) and whether the check digit is correct.

Grades: A (pass) if the symbol can be decoded, F (fail) if it can't.

Symbol Contrast

What this measures: the contrast between the reflectance of the dark bars and the light bars (background).

Grades: A, B, C, D, F

Minimum Reflectance

What this measures: the reflectance value of the bars. At least one bar must have a reflectance value half, or less than half, than that of the highest reflectance value for a space.

Grades: A (pass), F (fail).

Edge Contrast

What this measures: the sharpness of the bars. Is the edge of the bar crisp and clear, or is the colour patchy with poor definition of the bar?

Grades: A (pass), F (fail)

Modulation

What this measures: scanners and verifiers do not perceive narrow bars and spaces as clearly as they perceive wider ones. This diminished intensity of narrow elements compared to wide elements is called modulation and the formula for assessing this is:

Modulation = edge contrast (min) / symbol contrast

Grades: A, B, C, D, F

Note that if modulation fails, the problem is either with edge contrast or symbol contrast (and it's usually the fault of edge contrast).

Defects

What this measures: either irregularities within bars, spaces and clear margins (i.e. speckles) when printing the bar code or flaws in the substrate on which the bar code has been printed.

Grades: A, B, C, D, F

Decodability

What this measures: how closely the dimensions resemble a theoretical "perfect" bar code.

Grades: A, B, C, D, F