



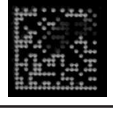

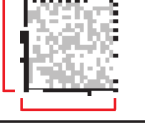
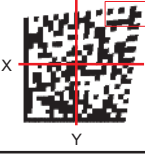
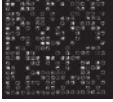


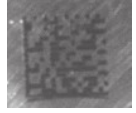

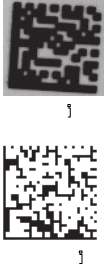
Emwi Group Technology White Paper

2D Verification Evaluation Parameters

High Quality Symbol:



Parameter	Description	Example	ISO 15415
Axial Non-Uniformity	Amount of deviation along a symbol's major axes		
Symbol Contrast	Difference in reflectance between light and dark symbol elements		
Cell Contrast	Difference in grayscale value between light and dark symbol elements		
Modulation	Difference in reflectance of light and dark symbol elements		
Cell Modulation	Deviation in grayscale values of symbol elements		
Decodability	Legibility per a reference decode algorithm		
Fixed Pattern Damage	Damage to the quiet zone, under pattern, or clock pattern		
Grid Non-Uniformity	Amount of deviation of grid intersection		
Minimum Reflectance	Minimum reflectance of light elements		

Parameter	Description	Example	ISO 15415
Reflectance Margin	Degree to which each module is correctly distinguishable in comparison to the global threshold		
Unused Error Correction	Remaining error correction available		
Print Growth	Variation of element size that could impede readability		

Barcodes are graded by verification equipment like barcode verifiers and machine vision systems, which assign values 0-4/A-F to the barcode for each of the above-listed evaluation parameters. A barcode's overall grade is determined by the worst result for each parameter, so the barcode is always as good as its poorest parameter. Typically, a barcode with a grade A, B, or C is considered acceptable quality, while a grade D or F signifies a poorly-marked or poorly-printed barcode. It is possible that a barcode with grade D or F may still be readable within your system using certain equipment, but without verification there is no guarantee that this same barcode will be readable at other points in your supply chain, by different equipment, or by your customers. By verifying barcodes to an agreed-upon barcode quality standard, such as those put forth by ISO or AIM, it is no longer a question of a barcode's readability, but rather of a particular reader's ability to read a certain grade.

ISO 15415

ISO 15416