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Data Matrix Verification

ISO/IEC 15415 Evaluation Parameters

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ISO/IEC 15415 Standard

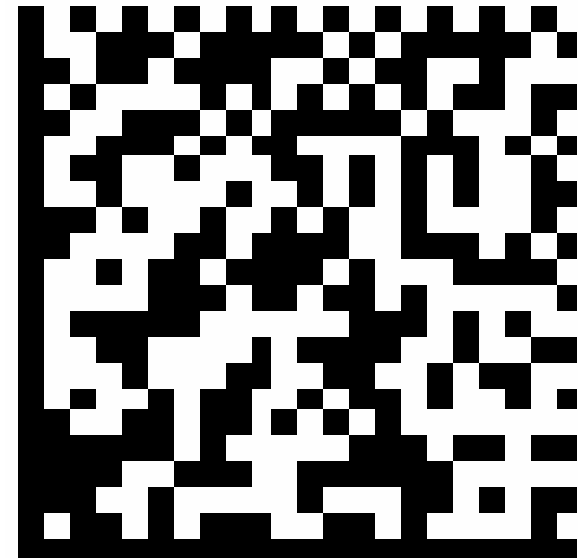
This standard specifies the methods for measuring, evaluating and grading a symbol's characteristics.

It applies to 2D and stacked symbols which are printed, laser etched or created by dot peen.

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Seven Parameters For Evaluating Symbols

- Symbol contrast
- Axial non-uniformity
- Grid non-uniformity
- Modulation
- Fixed pattern damage
- Unused error correction
- Print growth



High Quality Symbol

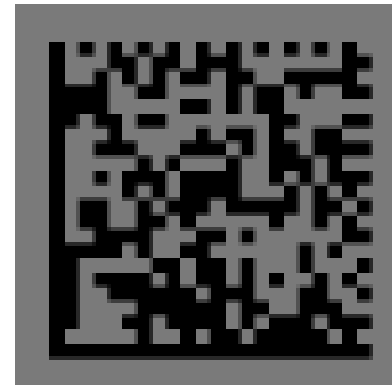
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Symbol Contrast

Symbol contrast is the difference in reflectance between the light and dark regions of a symbol.

Possible reasons for low contrast:

- Insufficient ink coverage
- Glossy laminate or over-wrap
- Insufficient ink coverage
- Inappropriate illumination angle



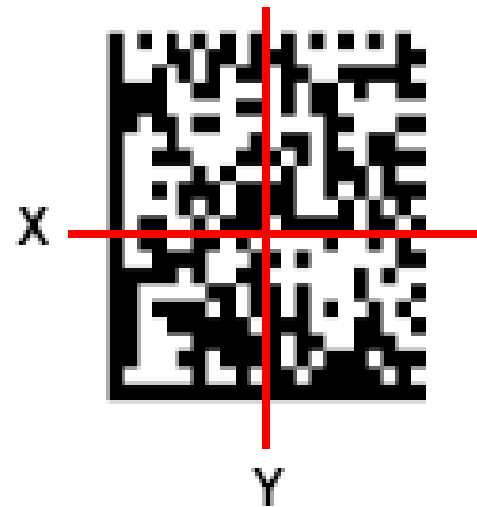
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Axial Non-Uniformity

Axial non-uniformity is the amount of deviation along a symbol's major axes.

Possible reasons for deviation:

- Mismatch of printing speed with symbol dimensions
- Printing software errors



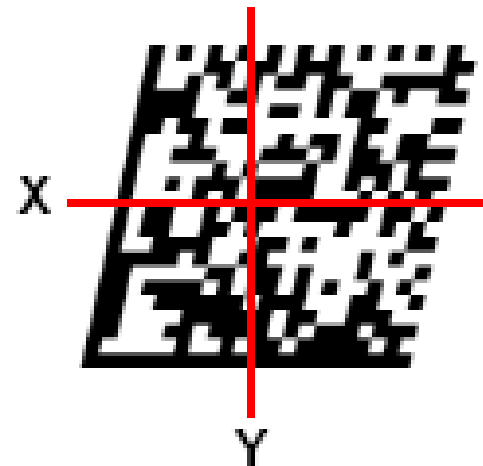
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Grid Non-Uniformity

Grid non-uniformity measures the maximum vector deviation from an ideal or theoretical grid.

Possible reasons for deviation:

- Transport errors in printing
- Variations in distance between the print head and substrate



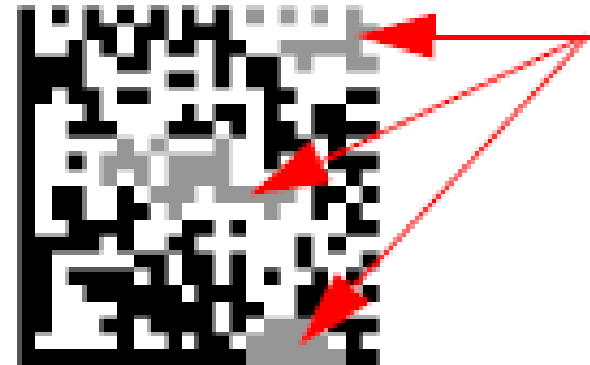
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Modulation

Modulation is the difference in reflectance of the light and dark elements of a symbol.

Possible reasons for differences:

- Defects (spots or voids)
- Misplaced modules
- Irregular substrate reflectance
- Variation in ink coverage



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Fixed Pattern Damage

Fixed pattern damage refers to damage of the quiet zone, finder pattern or clock pattern, which can severely inhibit readability.

Possible reasons for damage:

- Blocked printer nozzle
- Faulty thermal element
- Physical damage such as tearing or scuffing

**Missing elements
in clock pattern**



**Distortions in
finder pattern**

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Unused Error Correction

Unused error correction indicates the remaining error correction available.

Possible reasons for damage:

- Physical damage
- Bit errors due to defects
- Excessive print growth in one or two axes



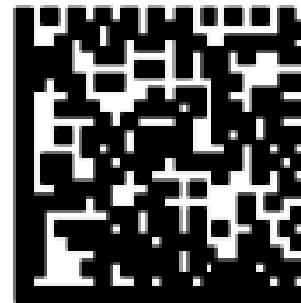
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Print Growth

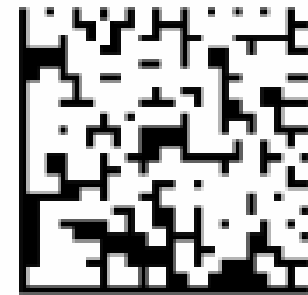
Print growth (or loss) is a variation of graphic features which could impede readability.

Possible reasons for variations:

- Dot size
- Incorrect thermal print head temperature
- Absorbency of substrate



Overprint



Underprint

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Summary

- The ISO/IEC 15415 standard identifies methods to evaluate, measure and grade the quality of 2D and stacked symbols.
- It includes possible causes for symbol degradation which can help determine marking equipment adjustments

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More information

- If you would like further information about verification, we recommend you view the additional seminars in the Verification series, such as **AS9132 Evaluation Parameters**.
- If you have questions regarding this topic, send us an e-mail via training@microscan.com.