TOSHIBA
Leading Innovation

T-SCAN & T-CHECK

BASICS OF ENSURING BARCODE READABILITY

Product brochure

> The T-SCAN & T-CHECK systems in combination with the Toshiba B-EX series industrial printers ensure that barcodes have a consistent level of quality for readability.

> Understanding machine vision validation and verification of 1D and 2D barcodes.

TOGETHER INFORMATION

WHY VERIFY ?

Did you know that 30% of all palletlabels have some form of problem, such as poor print quality, or an incorrect or missing serial code? Poor quality labels can result in various issues in the supply chain, from poor traceability and efficiency to significant fines issued for each incorrectly labelled product. Unreadable barcodes may require re-labeling, re-scanning, or even manual entry of critical information by a human operator – disrupting the productivity of the process and causing a significant loss of time. Bad barcodes may prevent error-tracking, causing a domino effect of failure down the line and resulting in costly scrap and rework. All told, these effects completely counteract the benefits of implementing an automated system, the result being inflated cost, loss of productivity, and increased errors.

So, what's causing these problems?

It may be hard to see, but print quality could be a major problem. For example, unsuitable paper could be used in the printing process, the rubber roller may be wearing out, the printer may be missing pixels from print head damage, or even a ribbon wrinkle could be producing diagonal voids. Any of these problems can cause the barcode on the label to become unreadable. Add wear and tear, and the quality will only get worse once the product leaves your premises. Another major issue is simply the lack of knowledge regarding the GS1 standards or for example the importance of white space around a bar code.

What do you need to do to ensure proper barcode quality?

- Monitor print and/or barcode quality with respectively validation or verification.
- Make sure that your labels follow the recommendations for the GS1 logistics label.

The purpose of barcode verification or validation is to ensure consistent readability and supporting 100% accurate automated data capture. Thanks to quality barcodes, the unique benefits of an automated system are realized: lower costs, higher productivity, and fewer errors.

WHEN SHOULD YOU VERIFY ?

To ensure that errors are prevented as early in the automated system as possible, verification or validation must occur before a part enters the system. A verification step should occur after a part is marked or labeled with a barcode and before the part reaches the station where the barcode is first read.

Barcode Marking Station → Verification → Barcode Reading Station

Proper verification ensures that every part is processed and shipped with a high-quality barcode, despite the fact that marking and labeling systems will degrade over time. A verification system is much more accurate than a standard barcode reader at identifying low-quality barcodes early in the process, before parts with bad barcodes make it through the line and are shipped to end customers. When barcode quality degradation is identified early, the marking or labeling system may be adjusted or replaced before unreadable barcodes are ever produced.

T-SCAN & T-CHECK VERIFICATION

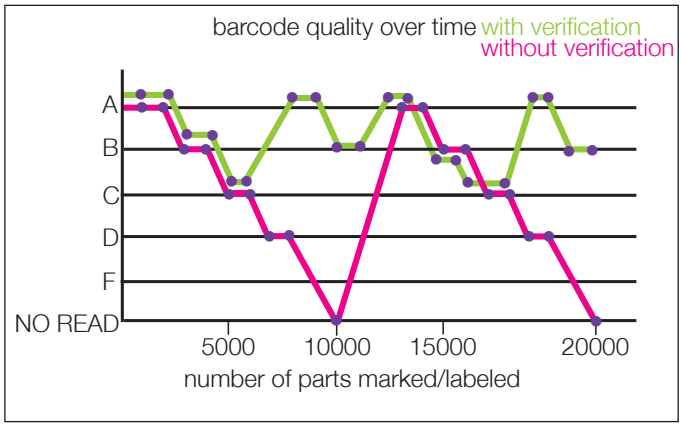
Depending on the requirements of a particular process, industry, company or customer, Toshiba TEC offers two levels of quality grading for ensuring barcode readability : T-scan and T-check.

T-scan ensures that barcodes are readable throughout a user-defined process. The system checks that the barcodes are readable straight after they are printed, and also validates that the contents of the barcodes are correct.

T-check provides objective measurements of barcode quality towards published barcode quality standards, using certain verification parameters as the criteria for passing or failing codes.

T-scan validator

T-check verifier



With verification, bad barcodes are prevented from being applied to the product, eliminating the chance for future failures.

Without verification, bad barcodes are not identified until they are unreadable. By the time a bad barcode is identified, thousands of poor-quality barcodes may have already escaped down the line.

VERIFICATION EVALUATION PARAMETERS & STANDARDS

There are a number of verification evaluation parameters that determine barcode quality. Published barcode quality standards can be used to ensure that the barcode quality is as high as possible, and catch any issues early during the printing or marking process. Please note that verification to an ISO standard also requires specific lighting. If you require verification to a specific standard, please contact Toshiba TEC.

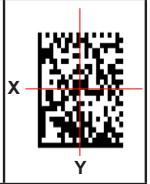
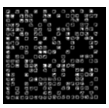
Verification standards

ISO 15416
ISO 15415

Samples of 1D evaluation parameters

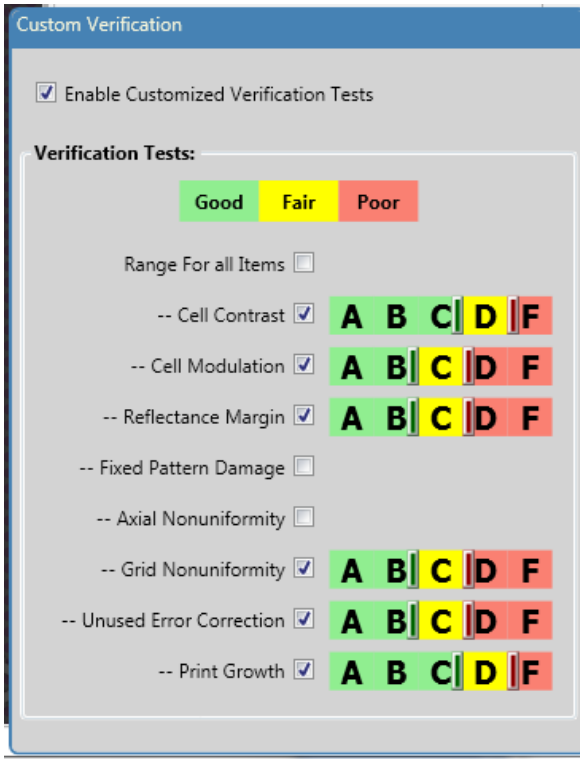
Parameter	Description	Example
Defects	Voids in bars or spots in spaces	
Minimum Edge Contrast	Minimum reflectance difference for any bar/space combination	
Symbol Contrast	Difference in reflectance between the darkest bar and the lightest space	
Quiet Zone	Size of the quiet zone	

Samples of 2D evaluation parameters

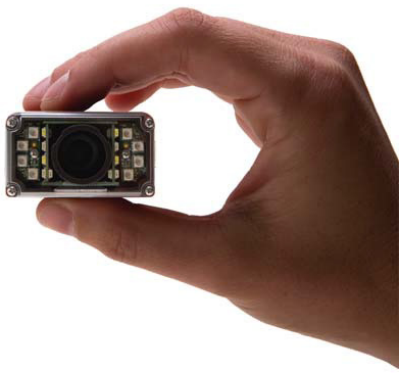
Parameter	Description	Example
Axial Non-Uniformity	Amount of deviation along a symbol's major axes	
Symbol Contrast	Difference in reflectance between light and dark symbol elements	
Minimum Reflectance	Minimum reflectance of light elements	
Print Growth	Variation of element size that could impede readability	 Overprint  Underprint

VERIFICATION GRADES

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 a system using certain equipment, but without verification there is no guarantee that this same barcode will be readable at other points in the supply chain, by different equipment, or by end 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.



Verification grades



THE TOSHIBA SOLUTION FOR ENSURING LABEL QUALITY

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Toshiba's T-Scan or T-Check systems consists of a bundle containing:

- T-Scan validator or T-check verifier
- B-EX4T1 printer
- Expansion I/O board
- Ribbon save module
- T-Scan or T-check mounting kit
- Ethernet cable (only for the T-Scan)

In combination with the Toshiba B-EX series industrial printers, the T-Scan immediately ensures that the barcodes that are printed are readable. With the T1 series, unreadable barcodes are voided. With the T2 series, the printer stops after an unreadable barcode.

In combination with the Toshiba B-EX series industrial printers, the T-Check keeps a close eye on the barcode quality and immediately detects any issues in print quality. With the T1 series, unreadable barcodes are voided. With the T2 series, the printer stops after a failed verification check.

Your Toshiba Dealer:

T-SCAN & T-CHECK powered by MICROSCAN.