



# GS1-128 SHIPPING LABEL IMPLEMENTATION REPORT

OCTOBER 2024



**BAR CODE  
GRAPHICS**





## Suppliers and third-party logistics

companies should be reading this to make sure they are aware of common mistakes or deficiencies in requirements. Awareness of these is crucial to having quality labels even when dealing with poor requirements, as well as for protecting themselves in the case of noncompliance issues or fighting retailer offsets.

**Retailers** also need to make sure that their requirements are actually in line with the needs of their equipment and what they are expecting from their suppliers. This helps their supply chain perform efficiently, and creates the fair and consistent foundation necessary for measuring and enforcing compliance.



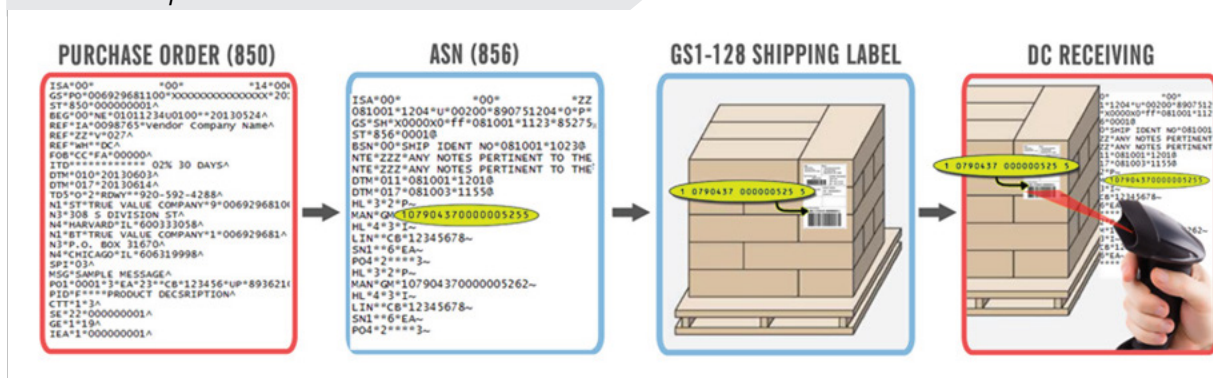
Bar Code Graphics is in the unique position of being close to the letter of the GS1 Standards and also understanding the day-to-day real-life implementation of these standards in various industries. We have participated in developing new GS1 Standards and refining existing ones. Apart from this, we have also authored and advised on label specifications for many retailers. Since our label testing programs began in the 1990s we have evaluated more GS1-128 shipping labels from more suppliers and more retailers than any other organization.

This document pulls from real retailer specifications that are publicly available. We will first lay out the criteria we use to assess the quality of retailer requirements. Then we will provide some example specifications showing these criteria implemented correctly and some examples of specifications that have some errors.

# DEFINING A GS1-128 SHIPPING LABEL

A GS1-128 shipping label or GS1 logistic label is used to identify logistic units. A logistic unit would typically be a carton or pallet being shipped from one company to another, but could be any configuration of goods that needs to be tracked through a supply chain.

Relationship between SSCC-18 and EDI documents



Your typical GS1-128 shipping label is a 4" x 6" label with Ship From and Ship To fields at the top and an SSCC-18 barcode at the bottom, but they come in many variations. There isn't one format that would work for all of the different retailer applications so it's best to think of the GS1-128 shipping label standards as a design framework with some looser and some stricter guidelines. The only required component for a label to be considered a GS1-128 shipping label is the inclusion of an SSCC-18 barcode. This barcode enables the core function of a GS1-128 shipping label – tracking logistic units – because each SSCC-18 is globally unique and in conjunction with an ASN/856 can be used to track any carton and identify its contents.

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Data breakdown of an SSCC-18 barcode



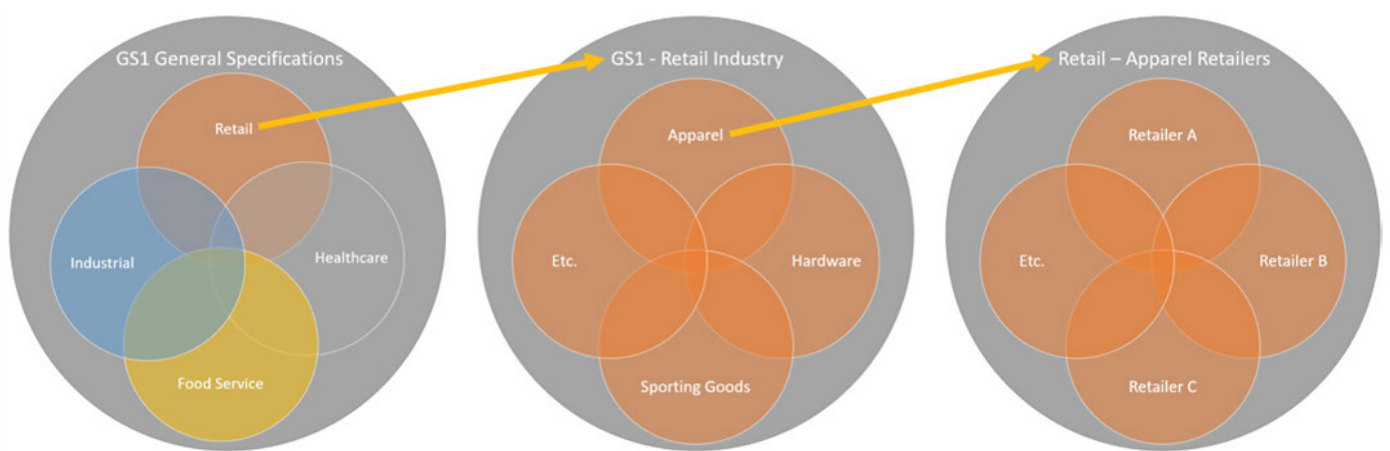


Retailers often showcase their requirements' proximity to GS1 Standards. It is an effective means of conveying to their suppliers the general framework of their labeling requirements and also shows that they are interested in being fair and reasonable.

*The GS1 General Specifications cast a very wide net and are intended to apply to many industries and different scanning environments.*

But what does it mean to follow GS1 Standards? The most recent edition of the GS1 General Specifications, version 24.0 ratified January 2024, is a massive and dense document totaling 509 pages, covering everything from what types of barcodes are acceptable for regulated healthcare non-retail items to the proper data formatting for encoding item weight in kilograms with 3 decimal places into a barcode.... whew!

Does a clothing retailer who says they follow GS1 Standards need to be concerned with requirements for medical devices? Of course not. The GS1 General Specifications cast a very wide net and are intended to apply to many industries and many different scanning environments. A retailer picks and chooses from the GS1 General Specifications and then tailors those standards into requirements that fit their needs.



A retailer’s requirements should be a narrow and specific document compared to something like the GS1 General Specifications. GS1 General Specifications may form the basis for those requirements, but a retailer’s requirements will be specific to their needs and look very different than a company in healthcare’s requirements. Even within the retail industry, there will be overlap between different sectors, but the needs of an apparel supply chain are likely different than a hardware supply chain.

<p><b>GS1 General Specifications</b></p>	<p><b>Retailer Requirements</b></p>
<p><i>Global</i></p> <p><i>Covers many industries and applications</i></p> <p><i>Covers all types of scanning environments</i></p> <p><i>Relevant to all types of equipment</i></p>	<p><i>Retailer specific</i></p> <p><i>Tailored to specific needs</i></p> <p><i>Targeted scanning environments</i></p> <p><i>Designed for specific equipment</i></p>

# TERMINOLOGY

Insistence on correct/up-to-date terminology can sometimes veer towards pedantry. In Chicago, our tallest building is called the “Sears Tower” and anyone correcting you to call it the “Willis Tower” is immediately suspect. In label requirements, where technology and standards are frequently changing, precision and contemporaneity actually matter. Using terms that are incorrect or obsolete unfortunately gives the impression that the requirements are not that important and have not been revised in some time. There’s no civic pride in calling an SSCC-18 an “ASN number”.

The worst offender is the term “UCC”. The Uniform Code Council is the predecessor to the GS1, but the “UCC” hasn’t existed in nearly 20 years. When you see this in retailer requirements it’s a tip-off that either requirements aren’t being re-evaluated or that the person writing them is not staying current with the standards. It also creates confusion. The GS1-128 barcode symbology is the most commonly used barcode type on retailer logistic labels. What you will see in a number of retailer requirements is a reference to UCC-128 barcodes. This works out fine... if you either know what you are doing or have labeling software that hasn’t been updated in 20+ years. For new companies and new software, the “UCC-128” symbology is nowhere to be found.

Besides confusion, how much does terminology matter? If the company knows what works for them, and hasn’t changed their systems, everything should be fine, right? Well, no. If a retailer is using outdated terms, it means they aren’t staying current with the standards. If they aren’t staying current with the standards, it means they haven’t considered how changes to the standards impact their requirements.

A perfect example is the update to how ISO/ANSI barcode print quality grades are determined. ISO/IEC 15416 changed the way print grades are calculated with the general effect of making the grading more tolerant. Let’s say a barcode sample measured right at the upper end of the “D” grade range (1.4/10/660) under the old print quality calculation. It is very possible that under the new method that barcode could receive a “C” grade (1.5/10/660). For many retailers this could be the difference between a compliant and non-compliant barcode. If a retailer isn’t staying up to date with the GS1, with ISO/ANSI standards, and with the rest of the industry, what are the chances they are updating their barcode verification equipment to account for a change like this?



# “THIS IS THE ONLY RETAILER THAT’S CHARGING ME BACK FOR THIS.”

When we hear “this is the only retailer that \_\_\_\_\_”, we have to wonder where that’s coming from. Sometimes it is no doubt bluster on the part of a frustrated supplier that wants to point fingers. For other suppliers it may be an accurate reflection of their experiences, but that doesn’t mean the retailer in question is doing something wrong. In our capacity as administrators of certification and compliance programs for a number of retailers, we are afforded the insight of why labels and specific requirements matter to that retailer and their processing. In these programs, we can vouch for the fact that the requirements do not arise out of thin air - they are all grounded in a specific need on the retailer’s part. So, why isn’t a supplier being charged back by all of their other trading partners?

*What (suppliers) are missing are the inconsistent thresholds for quality and widely varying uses of the labels at a retailer level.*

What the available specifications tell us is that some retailers actually rely on these labels. This is conveyed in their detailed specifications, written in concert with the needs of their scanning equipment. The available specifications also suggest that many retailers might not even be scanning these labels. If a company is sending wildly non-compliant labels to a retailer who isn’t placing a priority on compliant labels, it is no wonder that they aren’t receiving feedback or offsets.

This is one of the harms of a retailer publishing specifications that are incorrect, not actually followed, or not needed. A supplier may be working with many retailers and only receiving negative feedback from a few of them. The supplier only sees that their own process, software, printers, templates, are all generally consistent. What they are missing are the inconsistent thresholds for quality and widely varying uses of the labels at a retailer level. A retailer who needs labels to scan on automated sortation systems has very different needs than a retailer content with manually processing all cartons and key entering the SSCC-18 (if they even use it at all). Retailer 1 may emphasize on reporting and communicating these issues, while Retailer 2 may just build workarounds.

# “HOW DO I GET THE LABELS? WHERE DO THEY COME FROM?”

A plan to implement the requirements is just as important as knowing a specific set of requirements exists. Some companies make the decision to take on all responsibilities related to printing and creating/designing a shipping label in house. This requires an adequate level of training and integration in regard to both hardware and software. The second option is to use a third provider. Some third-party providers specialize in on demand printing services while others offer a web-based printing solution. The web-based printing option allows companies to simply print a prepopulated/formatted label after completing a defined process. This option has gained popularity because of its ease and removes the need to master barcode software applications. No headaches of trying to make sense of what type of barcode to select. Is Code 128 the same as GS1-128? What is a Function Code 1? How do I add it? What is an SSCC-18 number? Where does the data come from? Is your head spinning yet?

Although web-based solutions remove some struggles, what some may consider them to be, associated with label design and barcode formatting there are still obstacles with print quality. Companies should take time to understand the printing process and printer settings required to produce a quality label that meets the needs required by the trading partner. Downloading and printing a file sounds like a pretty simple process in theory.



However, we’ve worked with companies that experience annoying and agonizing struggles with this “simple” printing process. Things like printer resolution, printer settings, label stock, scaling can all have a negative impact on barcode print quality.

***To review common factors associated with printing PDFs, please visit:***  
<https://www.barcode.graphics/hidden-barcode-pitfalls-the-complexities-of-printing-from-pdfs/>

# QUALITY REQUIREMENTS... AND EVERYTHING ELSE

Based on our experience with standards and retailer compliance programs, as well as our review of dozens of retailer requirements, we developed the following criteria for evaluating retailer requirements:



## **ALIGNMENT WITH GS1 STANDARDS**

Including references to the GS1 Standards places the requirements in some context and can help to provide answers when details are left out.



## **IMAGES OR EXAMPLES OF LABELS**

These can go wildly wrong and end up creating issues, but accurate examples go a long way to helping suppliers understand how a label should be laid out.



## **DETAILED SIZING REQUIREMENTS**

Every barcode used should have a defined minimum height and minimum x-dimension.



## **CERTIFICATION PROCESS**

Prior to shipping, label testing should be done with an actual physical label following GS1 protocols. Testing that allows a faxed or emailed label sample is a major red flag. Allowing this kind of testing undermines the credibility of retailer requirements that call for a certain print quality.



## **FULL ISO/ANSI PRINT QUALITY GRADES**

Reference to a full ISO/ANSI grade (numeric grade, device aperture, and lighting source wavelength) is a must. A nebulous statement like “barcodes must be scannable” without reference to concrete standards is meaningless. It does not provide any clarity on what is actually expected of the suppliers.



Drawing from the actual retailer specifications we reviewed, we've developed some sample specifications that exemplify the good and bad implementations of the topics covered by the requirement criteria. Each have a label example and accompanying text.

For more examples from actual retailers, please visit:

<https://www.barcode.graphics/2024-retailer-gs1-128-examples/>

### Good Example:



### Retailer A

Specifications are developed based on GS1 General Specifications.

- Suppliers must maintain an ISO/ANSI print quality grade of "C" (1.5/10/660) or better.
- GS1-128 shipping label certification is required for all new suppliers. Current suppliers must re-certify labels whenever significant changes are made to labeling hardware, software, or print media.
- Suppliers must have a physical label sample approved through Example Barcode Testing Company.
- Labels found not to be in compliance are subject to offsets of \$10/carton.

### Zone I (SSCC-18) Detailed Specifications

#### Bar Code Specifications

Height	1.25" minimum/1.5" recommended
X-dimension	19.5 mil (0.0195") minimum
Quiet Zone	0.25" minimum

CATEGORY	?	COMMENTS
Alignment with GS1 Standards	YES	Clearly stated alignment with GS1 Current term used
Image/Examples (Accurate)	YES	Example barcodes are scannable and properly formatted
Detailed Sizing Requirements	YES	Full sizing requirements present
ISO/ANSI Print Grade Specified	YES	Full ISO/ANSI grades specified
Physical Certification Process	YES	
Listed Compliance Offset Charges	YES	

**Bad Example 1 :**



**Retailer B**

UCC-128 specifications adhere to ANSI/ISO GS1 6 Standards.

- Suppliers must maintain an ISO/ANSI print quality grade of "B".
- UCC-128 shipping label certification is required for all suppliers.
- Suppliers must email a sample to [test@retailerb.com](mailto:test@retailerb.com) or fax a sample to 212-555-1000.
- Labels found not to be in compliance are subject to offsets of \$10 carton.

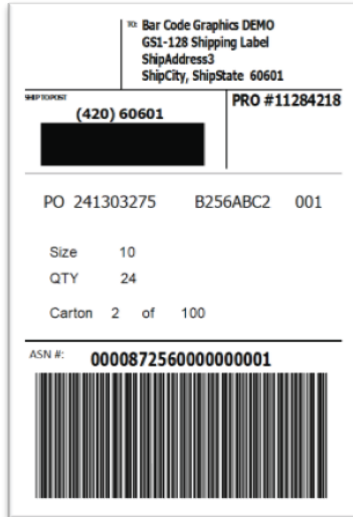
**Zone I (SSCC-18) Detailed Specifications Bar Code**

**Bar Code Specifications**

Height	1.25" minimum/1.5" recommended
Quiet Zone	0.25" minimum

CATEGORY	?	COMMENTS
Alignment with GS1 Standards	NO	Alignment with GS1 stated, but references outdated document and terms
Image/Examples (Accurate)	NO	Barcodes are improperly formatted and sizing is not accurate
Detailed Sizing Requirements	NO	Barcode X-dimension not specified
ISO/ANSI Print Grade Specified	NO	Only letter grade, not ISO/ANSI grade
Physical Certification Process	NO	Faxed or emailed samples are used for testing
Listed Compliance Offset Charges	YES	

**Bad Example 2 :**



**Retailer C**

UCC-128 specifications.

- Supplier labels must be scannable. Non-scannable labels are subject to compliance offsets.

CATEGORY	?	COMMENTS
Alignment with GS1 Standards	NO	No reference to standards. Outdated terminology used
Image/Examples (Accurate)	NO	Example barcodes are incorrectly formatted or missing
Detailed Sizing Requirements	NO	No sizing provided
ISO/ANSI Print Grade Specified	NO	No grade provided
Physical Certification Process	NO	
Listed Compliance Offset Charges	NO	



# WHAT'S NEXT?

In the samples we've assessed we have blanked out the retailer names because our intent in evaluating these is not to call out particular retailers. What we hope the samples and commentary convey is that good GS1-128 label specifications are necessarily detailed, but don't need to be overly complicated. There are some key areas that need to be covered in order for retailers and suppliers to be on the same page:

- [Alignment with GS1 Standards is a start](#), but GS1 Standards are too broad to mean anything concrete without careful selection and application of the relevant topics in a retailer's requirements.
- [Technical terms change over time with new technologies and with the refinement or expansion of standards](#). Staying up to date with these terms is first and foremost important in keeping effective and clear requirements, but it is also a way of demonstrating that a retailer is engaged and puts value on their requirements and the associated supply chain needs.
- [Good GS1-128 label specifications are necessarily detailed](#), but don't need to be overly complicated. They should include:
  - Accurate example labels
  - Specific ISO/ANSI print quality minimums
  - Barcode sizing details
- [Requirements need to be in sync with a retailer's specific supply chain needs and scanning environment](#). Inaccurate, insufficient, or unnecessary requirements create immediate problems for a retailer and supplier, but also create wider problems for suppliers working with multiple retailers.

Retailers should take this opportunity to review their own requirements. Are key topics covered? Are the requirements in line with how GS1-128 labels are used? How do their requirements compare to other retailers? How could shortcomings in the requirements complicate their internal processes as well as their relationship with suppliers?

Suppliers should take a broad look at all of the retailers they work with. How well do their labeling requirements match up with the actual use of those labels? What feedback does the retailer provide? If a supplier has received offsets, are they being given enough information and the opportunity to comply with a retailer's requirements?



# ABOUT BAR CODE GRAPHICS

Since the inception of the UPC, Bar Code Graphics, Inc. has been recognized as the US Identification/Barcode Authority and has assisted hundreds of thousands of companies with their barcoding needs by specializing in barcode origination, print quality and data management requirements. From creating the graphic barcode files which are placed on packaging to administering barcode compliance for major retailers, Bar Code Graphics is recognized as the trusted source for education and assistance empowering companies to comply with respective GS1 and ISBN global guidelines and also specific trading partner requirements.

Identification Labs is the testing and certification division of Bar Code Graphics and is the largest barcode testing organization in North America. Many of the top US retailers, distributors and manufacturers rely on Identification Labs to administer their barcode certification and compliance programs. Even though each of these companies have differences in their supply chain requirements and data needs, their barcode and labeling requirements are based on global standards. Each year Identification Labs evaluates over 10,000 barcode samples involving product packaging, coupon and logistic shipping labels.

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