



Supplier Bar Code Labeling Guidelines

**This document contains specifications for bar code labels used
on material received at Graco Inc. facilities from suppliers.**

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1 Introduction

1.1 Understanding the Purpose of Bar Code Labeling

Graco has instituted a bar code labeling program to take advantage of the benefits these labels can provide. The goal of this program, which is laid out in this document, is to have quality bar code labels attached properly to every shipment Graco receives from its suppliers, which must include the following information for shipment identification:

- Graco Part Number
- Graco Purchase Order Number
- Shipment quantity
- Source of material within the shipping container

Bar code labels allow effective and efficient capturing of data for:

- Receiving
- Warehouse input/output
- Production counts / Cycle counting
- Shipper generation

1.2 Participating in Graco's Bar Code Labeling Program

To get involved in Graco's bar code labeling program, follow these simple steps:

1.2.1 Review Graco's Guidelines

This document, Supplier Bar Code Labeling Guidelines, contains the basic information you need for producing your bar code labels and correctly placing them on shipping containers to Graco. For additional information about Graco's bar code labeling specifications, you may reach out to your Graco Buyer to request the following documents:

Graco Engineering Standard No. 0.0870, *Bar Codes*

Graco Engineering Standard No. 4.0701, *Product Identification*

Graco Engineering Standard No. 7.0010, *European Union Product Regulation*

It's important that you adhere to all industry standards and Graco specifications indicated to increase the likelihood that your bar code labels can be easily read by all Graco scanning equipment.

1.2.2 Decide Whether to Make or Buy Your Labels

You may choose to purchase your bar code labels or produce them in-house. To purchase labels, there are multiple printing suppliers and/or bar code labeling equipment suppliers.

In most cases, it will be more efficient for you to produce your own bar code labels in-house. To produce your own labels, you will need:

- An operating system with label software
- Appropriate sized labels
- A printer that is capable of meeting print quality requirements

There are many computer hardware and software packages available in the market for producing bar code labels. Supplier suggestions for bar code labeling hardware and software can be found in Appendix B.

Before you purchase or replace anything, have the vendor create a sample bar code or help you develop the Graco specific bar code to send to Graco for evaluation and approval. Submitting bar codes prior to your purchase will ensure the hardware/software you are considering can produce labels that meet Graco print quality standards. Samples must be produced in the same format and material that will be used in production. If extra protection is required with your label (i.e. lamination or placement in a clear plastic envelope), your samples must be submitted in the protective covering that you plan to use.

1.3 Learning More About How to Get Started

Knowing the answers to some common questions about bar code labeling can help. Below are some questions and answers:

Q: How much will it cost to start bar code labeling?

A: Start-up costs are different for each supplier. It depends on many factors such as if you are going to produce labels in house. If so, it depends on whether you already own hardware or if you'll need to purchase any. The price of software can vary, but generally runs around \$2,000.

Q: Will Graco not use us as a supplier if you do not participate in the bar code program?

A: A supplier may not be dropped for not using our bar code program, but it will be considered for any new business opportunities.

Q: How much does a supplier need to know about bar code symbols?

A: You do not need to be a master. This document will provide you with the basic information you need to know about bar code symbology. If you'd like to know more, you can refer to the Graco Engineering Standards. If you use the right equipment and follow Graco's specifications, you should be able to produce acceptable bar code labels.

Q: What issues are most likely to occur with our bar code labels?

A: Scanning problems are the most common. They can occur for a number of reasons, but most often it is due to printing problems or incorrect settings for bar and space sizes or ratios in the symbols such as:

- Forgot to put space identifier (DI) in the scan of the bar code
- Incorrect size ratio of wide to narrow bars and spaces
- Uneven bar edges
- Voids in bars
- Faded bars
- Spots or flecks of ink in spaces
- Low print contrast ratio

Q: What types of bar code labels does Graco require?

A: Graco requires shipping labels (vendor carton label) on every pallet/container received. Individually packaged products must be labeled with one of two types of parts identification labels/product carton labels or Universal Product Code (UPC) labels depending on the size of container.

Q: How many labels are required per Graco shipment?

A: One label is required per pallet/container for each order to indicate the quantity of parts that are contained with that shipment.

Q: What if a pallet/container contains more than one part number or covers multiple purchase orders?

A: Each part number or purchase order requires a separate label. For example, if a pallet contains two purchase orders, two labels are required.

Q: Should labels be located in any particular area on the shipping container?

A: Correct label placement is very important. Labels are to be placed in a specific area based on the type of container being used so that they are accessible for scanning. Poorly placed or obstructed labels will slow down the receiving process and delay material payments. Recommended placement for labels on various containers is described in the General Requirements section of this document and illustrated in Appendix C.

2 General Requirements

2.1 Types of Labels Required

Graco allows one of three types of bar code labels that are described below. The type of label used depends on how material is packaged for the shipment.

Vendor Carton Labels	Use these shipping labels to identify the pallet/container in every shipment sent to Graco. Graco will use the label information in its receiving process.
Product Carton Labels	Use these part identification labels for individually packaged products that you manufacture for Graco and ship directly to a Graco Distribution Facility if the individual package can accommodate a 4" x 6" label on the side (preferred location) or top of the package.
UPC Labels	Use these parts identification labels for individually packaged products that you manufacture for Graco and ship directly to a Graco Distribution Facility if the individual package cannot accommodate a 4" x 6" label.

Specifications for the three allowable types of Graco labels are defined in the next few sections. If necessary, check the Glossary at the end of this document for the meanings of various terms used throughout this document.

2.2 Label Size, Material, Symbology, & Print Requirements

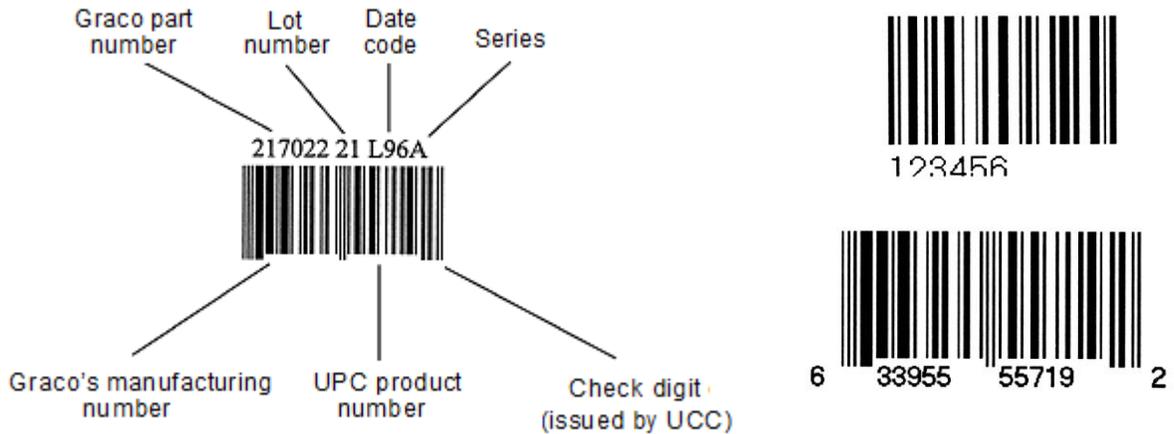
Your bar code labels should meet the following general requirements:

2.2.1 Graco Vendor Label:

Label shall be large enough to meet minimum information criteria as listed below:

- Block and data arrangement shall be per the Graco sample label shown below
- Block / data shall be bordered with vertical and horizontal lines
- Block can vary in size to accommodate minimum symbol requirements and 'Quiet Zone' per UCC/EAN standards
- A title shall be included in the block in the upper left corner. Text should be 8 lines per block (LPB)
- Bar codes shall be per UCC Application Standard for Shipping Container Codes with minimum 'X' dimension of 0.014". Bar code quantity shall be per ANSI X3.182.
- Bar codes cannot be next to each other horizontally on the same plane. One bar code per line only.

- Bar code symbology should be CODE 128. Refer to UCC/EAN Standards for specific formats and designs.
 - Bar codes on vendor carton labels and product carton labels, except for UPC labels, should use Code 128 symbology as shown below. Code 128 symbology offers the full 128 ASCII character subset developed by ANSI to encode complex product identification



ation. It improves scanner read performance, allows for self-checking, and provides data message management function codes.

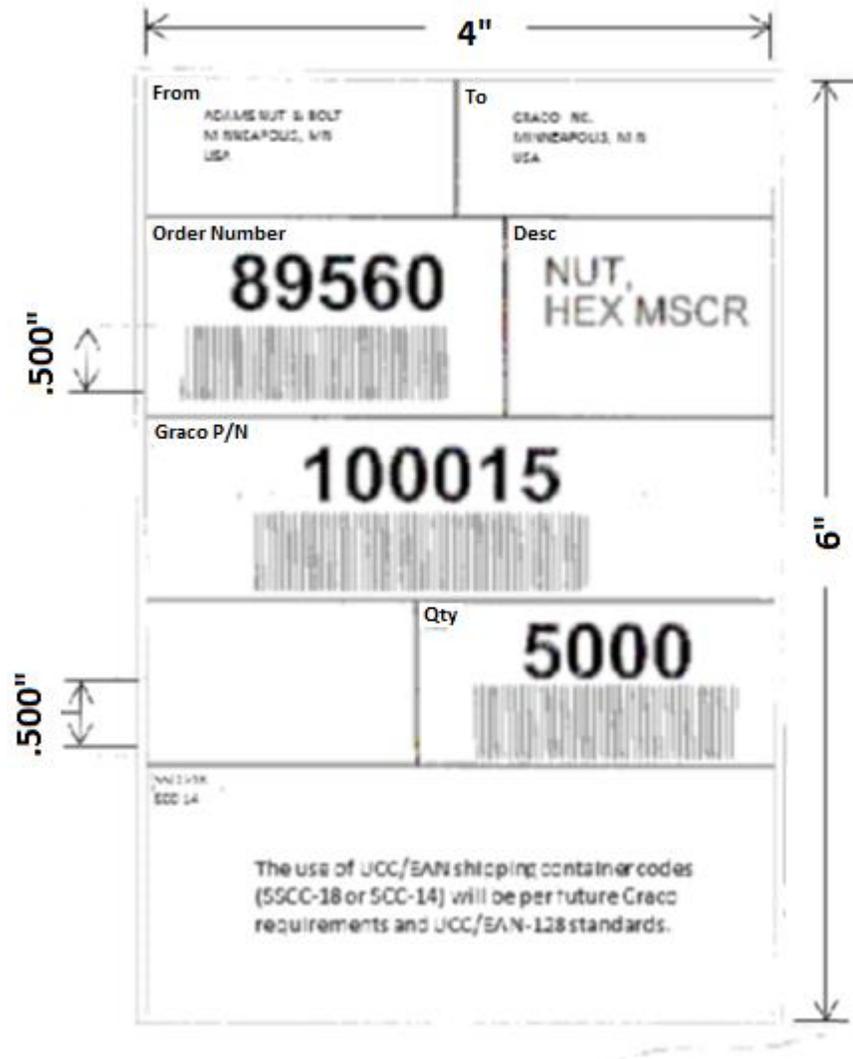
- Bar codes on UPC labels should use the UPC symbology, which consists of numeric data (12 digits). This system, a subset of the more general EAN code, is used in almost all forms of retailing in the United States.

Bar code specifications for Graco UPC labels, which are to be used on individually packaged kits and products too small to accommodate a 4-inch by 6-inch label that are shipped directly to Graco's distribution facilities:

- Label size must be 1.25 inches high X 1.125 inches wide
- Block/data arrangement shall be as shown on the sample Graco UPC label.
- Human readable text printed 6 lines per block (LPB)/ 12 pt./0.12 inches high on the top of the label must include:
 - GRACO P/N: Part number designated by Graco; in absence of specific part number, use Purchase Order line item number
 - LOT NO: Manufacturing lot number (if applicable)
 - DATE CODE: Month, year
 - SERIES: series code for the product
 - UPC symbol size shall be per nominal UCC magnification factor (nominal is 0.816 inches high X 1.175 inches wide). Quiet zones must be a minimum of 0.25 (1/4) inch on both ends of symbols. Inter-character gap width, the space between symbol characters, should be equal to the width of the narrow symbol elements.

Bar code specifications for Graco Carton Labels shall be large enough to meet minimum information criteria as listed below:

- Block and data arrangement shall be per Graco sample label shown.
- Block / data shall be bordered with vertical and horizontal lines.
- Block can vary in size to accommodate minimum symbol requirements and "Quiet Zone" per UCC/EAN Standards.
- A title shall be included in the block in the upper left corner. Text should be 8 lines per block (LPB).
- The size of the human readable text in each block shall be as follows:



- FROM - 6 LPB (12 pt)
- GRACO P/N (90) - 2 LPB (42 pt)
- DESC - 4 LPB (20 pt)
- QTY (30) - 2 LPB (42 pt)
- ORDER NUMBER (400) - 2 LPB (42 pt)
- Bar codes shall be per UCC Application Standard for Shipping Container Codes with a minimum "X" dimension of .014". Bar code print quality shall be per ANSI X3.182.
- Bar codes cannot be next to each other horizontally on the same plane. One bar code per line only.

- Bar code symbology should be Code 128/. Refer to UCC/EAN Standards for specific formats and design.

2.2.2 Material

- All label material **MUST** be white in color
- Material thickness = .006
- Material = coated bleached Kraft paper, 41# / ream weight
- Adhesive = permanent hot melt rubber (emulsion rubber)
- Temperature range = -65 to +200 degrees F
- Shelf life = one year at 72 degrees F and 50 % relative humidity

2.2.3 Print

- The printing on the labels **MUST** be back ink
- The ink or ribbon in your printer **MUST** be of proper carbon content to pass Visible Laser Diodes at wavelengths between 670 and 700 nanometers to ensure that your bar codes can be read by Graco's VLD scanners
- Bar code symbols **MUST** meet ANSI MH10.8.2 guidelines
- Unless otherwise specified, the recommended ribbon is a thermal transfer high speed wax (reference Lofton Label, Inc. # AD-102HS)
- Base film:
 - Material = polyester films
 - Thickness = 4.5 +/- micrometers
 - Tensile strength = 20 kg/mm² minimum
 - Optical density = 1.85

2.3 Data Requirements

The table below specifies requirements for each data area on Graco's vendor carton label. Refer to Figure 1 in Appendix C to see a sample vendor carton label.

DATA AREA TITLE	Indicators	Required Data Area Contents	Requirements: Human Readable Characters	Requirements: Bar Code Symbols
FROM		Supplier name and address, including city, state, and zip code	6 LPB/ 12 pt./ 0.12 inches high	N/A

TO		The words “Graco Inc.”, followed by street, city, state, and zip code of receiving location (specified on Graco PO)	Minimum 6LPB/ 12 pt./ .012 inches high	N/A
ORDER NUMBER	K	Purchase order number issued by Graco supplier	Minimum 2LPB/ 42 pt./ 0.42 inches high; bold text	0.5 inches high
DESC		Brief description of product	4LPB/ 20 pt./ 0.20 inches high	
GRACO P/N	P	Part number designated by Graco; in absence of specific part number, use Purchase Order line item number	Minimum 2LPB/ 42 pt./ 0.42 inches high; bold text	0.5 inches high
QTY	Q	Quantity per label/load or carton Master label quantity is total quantity shipped in all containers	Minimum of 2LPB/ 42 pt./0.42 inches high; bold text (maximum anticipated length for QTY symbol is 6	0.5 inches high
CARTON / LABEL		Quantity of additional cartons/labels for a shipment if more than one carton and/or label is used for the same shipment (for example, “1 of 5” would specify five separate cartons/labels in the same shipment)	4LPB/ 20 pt./ 0.20 inches high	N/A

If necessary, refer to Graco Engineering Standard No. 0.0870 Bar Codes for more detailed information.

2.4 Quality Assurance Requirements

Quality is an important aspect of any bar code system. When labels cannot be decoded quickly and accurately, the advantages of bar coding are lost. You, the supplier, have the responsibility to provide bar code labels that meet Graco standards. Graco, in turn, will inform you of any persistent label performance problems. To help ensure success at Graco receiving, it is recommended that you preform periodic verification audits to check the print quality and physical placement of your bar code labels on shipping containers. You can purchase verification equipment that will ensure that your bar code symbols meet Graco requirements.

2.5 Label Location & Protection Requirements

Bar code labels should be placed on packaging and protected according to the following guidelines.

2.5.1 Location of Vendor Carton Labels, Product Carton Labels & Master Labels

U.P.C. Symbol Location Guidelines Manual determines the proper location for the UPC symbol on individual retail packages as well as symbol locations for specific family groups. Refer to UCC Guidelines for additional examples not included in this standard.

The U.P.C. Shipping Container Code and Symbol Specification Manual contains guidelines and specifications not intended to be used on the consumer package of a product, but on the containers in which consumer packages are shipped from manufacturer to wholesaler and retailers. They are also applicable to container assortments of industrial/business products.

Example 1. Boxes that double as shipping containers which are scanned in a warehouse environment, shall be printed on the lower part of the side and end panels according to UPC Shipping Container Code and Symbols Specification Manual.

Example 2. Large flat boxes with a height of less than 6 inches may carry a 4" x 6" standard label on the top surface, lower right panel.

Example 3. Containers. The UCC guidelines recommend symbol location in the lower 25 % of the back label area or back of the container. If the back is not available, it should be located to the lower left of the main display panel on the lower 25 % of the container. Preprinting the UPC symbol as part of the label should be considered for economic reasons. (Reference U.P.C. Symbol Location Guidelines Manual Location, Guideline # 11, for cans, glass and plastic bottles.)

Always check the Graco Purchase Order or Material Release for any special labeling instructions. If the specified label cannot be affixed to the

container/package due to the container size or design, make special arrangements with Graco as to the location of the label.

Labels must be placed in clear areas on packages or cartons to facilitate the scanning process. Ensure that the bar code symbol (including quiet zones) is not obscured by anything such as graphics, other labels, banding, strapping, or any other material which may interfere with scanning.

Remove all bar code labels on returnable containers such as tubs or racks that have been designated to move material back and forth between the supplier and Graco before reusing the containers to prevent scanning incorrect labels.

Never place a bar code label over any old labels that may have been previously on the packaging or on shrink wrapped material where labels under the shrink wrap may cause problems in the scanning process.

If product is shipped to Graco in a single container, a duplicate of the vendor carton label or product carton label shall be applied/attached to the back of the packing list.

If product is shipped to Graco in multiple containers, a master label showing the total quantity of all containers shall be applied/attached to the back of the packing list. If multiple containers are shipped together on a single pallet, a master label shall also be attached to the fork-entry end of the pallet.

2.5.2 Label Protection

Bar code labels must be readable when product arrives at Graco. It may be necessary to use lamination, sprays, window envelopes, clear plastic pouches, etc. to protect bar code labels from moisture, weathering, abrasion, etc.

2.5.3 Packing List

Graco prefers that the packing list is attached to the outside of the container. It is also acceptable for the packing list to be placed inside the container. If the packing list is placed on the inside of the container, it must be placed on top of the product.

If the product is shipped in multiple containers and the packing list is placed inside a container, the packing list must be placed in container 1 of 'X' or in a container marked 'Packing List Enclosed'

Appendix A: Other Contacts for Bar Code Labeling Information

For information on industry standards for bar code labeling:

American National Standards Institute (ANSI) 11 West 42nd Street New York, New York 10036 Phone (212) 642-4900 Fax (212) 302-1286

European Article Numbering Association (EAN) Rue Royale 29 B-1000 Bruxelles (Belgium) Phone 32 2 218.76.74 Fax 32 2 218.78.85

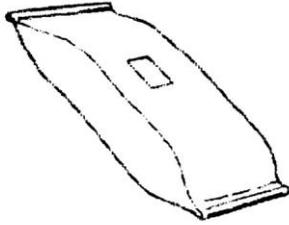
Uniform Code Council, Inc. (UCC) 8163 Old Yankee Road Suite J Dayton, OH 45458 Phone (513) 435-3870 Fax (513) 435-4749

For information on bar code labeling hardware/software, you may contact Graco's current supplier:

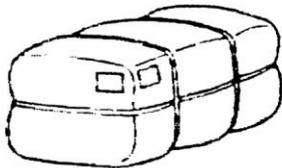
Lofton Label, Inc. 6290 Claude Way East Inver Grove Heights, Minnesota 55076 Phone (651) 457-8118 (800) 876-8118 Fax (651) 457-3709 E-Mail www.loftonlabel.com

Note: Graco is currently using a Zebra Stripe 500 thermal transfer printer to print bar code labels from an IBM mainframe. In the past, Graco used the label printing software EZ Label for Windows.

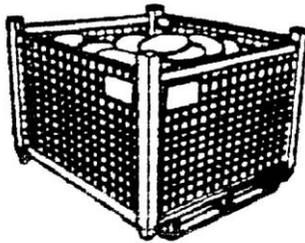
Appendix B: Label Locations on Various Packs



BAG*-Place one label at the center of face.



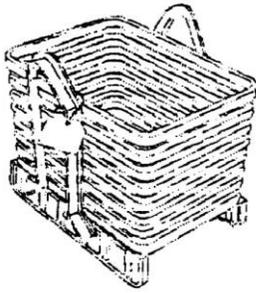
BALES*-Identical labels shall be located at the upper corner of an end and the adjacent side.



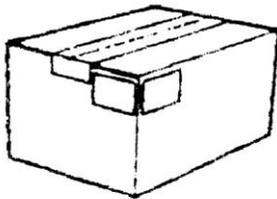
BASKET, WIRE MESH CONTAINER-Identical labels shall be located on two adjacent sides.

* For Parts and Service Support material, the Shipping/Identification Label SHALL NOT be attached directly on the surface of any Graco trademark packaging.

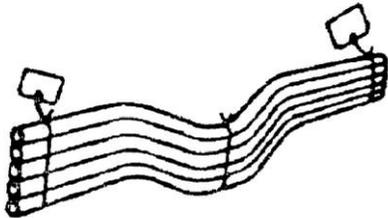
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METAL TUB*-Attach hang tag label to ear of tub, or use a label holder.



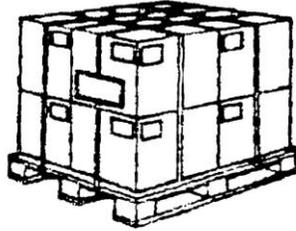
BOX OR CARTON*- Identical labels shall be located on two adjacent sides. The upper edges of the labels should be as high as possible up to 20 inches from the bottom of carton.



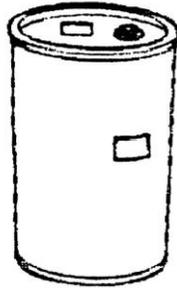
BUNDLE-Identical tags shall be located at each end.

* For Parts and Service Support material, the Shipping/Identification Label SHALL NOT be attached directly on the surface of any Graco trademark packaging.

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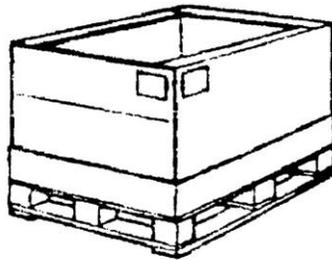


CARTON ON PALLET*- Each carton shall be individually labeled as described on previous page. Two identical Master Labels shall be printed. One Master Label shall be placed on the fork-entry side of the pallet. The other Master Label shall be applied/attached to the backside of the packing list.



**DRUM, BARREL,
OR OTHER
CYLINDRICAL
CONTAINER***

Identical labels shall be located on the top and near the center of the side.

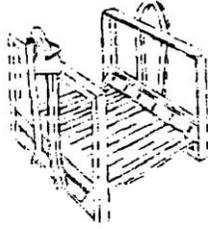


PALLET BOX-

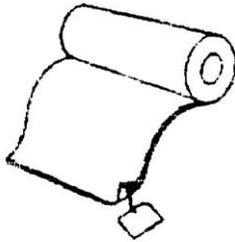
Identical labels shall be located on two adjacent sides.

* For Parts and Service Support material, the Shipping/Identification Label SHALL NOT be attached directly on the surface of any Graco trademark packaging.

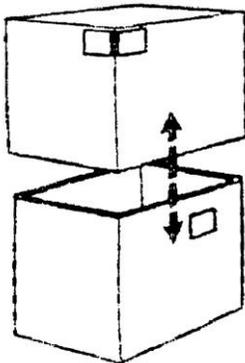
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RACK-Attach tag label to ear of rack.



ROLL-Hang one tag 2.0 in. (51 mm) from end of the material.



TELESCOPIC OR SET-UP CONTAINERS-
Identical labels shall be located on two adjacent sides of the outer box. Some applications may also require identification on the inner box.

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Appendix C: Summary of ANSI Print Quality Guidelines

ANSI's method for determining print quality takes the "real world approach" and looks at the printed bar code the way a scanner does. There are seven (7) areas of concern and each are graded either A through F or Pass/Fail. These areas of concern may be validated by verification equipment that is available for purchase.

Concern	Description	Action
Global Threshold	A check for the correct number of bars and spaces for the scanner to be able to decode the symbol.	Pass / Fail
Minimum Reflectance	The darkest bar's reflectance value must be less than half of the background's reflectance value.	Pass / Fail
Minimum Edge Contrast	The smallest contrast difference of a paired bar and spaces.	Pass / Fail
Symbol Contrast	Blackest possible bars printed on the whitest possible background would be 100% symbol contrast.	Grade D Value
Modulation	The difference in the intensity of wide element to narrow elements.	Grade D Value
Defects	Voids or spots in the spaces. When	Grade D

Glossary

Bar Code Symbol

Series of rectangular bars and spaces representing letters, numbers, symbols, or a combination thereof.

Code 128

Bar code developed by ANSI (American National Standards Institute), which offers the full 128 ASCII character subset. Used to:

- Encode complex product identification information.
- Improve scanner read performance, be self-checking, and provide data message management function codes.

EAN (European Article Number) Primary standard bar code for retail packaging used in Western Europe and the United Kingdom. EAN was created from the UPC.

Hang Tag

A label that is hung from an object/item. Typically used on bar, pipe or tubing bundles.

Intercharacter Gap Width

In bar code symbols, nine bars and spaces represent one character. The space between characters is called the intercharacter gap; its width should be equal to the width of the narrowest elements in the character.

Item

A single part or material purchased, manufactured, and/or distributed.

Label

A card, strip of paper, etc. marked and attached to an object to convey information.

Master Label

Vendor carton label or product carton label that shows the total quantity shipped when product is shipped in multiple containers.

Mil

A dimensional unit equal to .001 inch in the English system of measure, commonly used to refer to the width of bar code elements.

Pack, Package, Pallet, or Container

A unit which provides protection and containment for shipping items from one point to another.

Print Contrast

Ratio of reflectivity between the bars and spaces in a bar code symbol. Dependent on the reflectivity of the label material and ink and the wavelength of light used to read the label. Typically expressed as a percentage derived from this formula:

$$\text{Print Contrast} = \frac{(\text{Reflectivity of spaces}) - (\text{Reflectivity of bars})}{(\text{Reflectivity of spaces})}$$

Quiet Zone

The area immediately preceding the start character and following the stop character and which contains no markings that would interfere with the scanning of the code symbol.

Symbology

A discrete set of characters used to represent and transmit information; a set of rules for encoding information in a bar code symbol.

UPC (Universal Product Code) Standard bar code symbol for retail packaging used in the United States. The UPC symbol usually incorporates all encoded information into one symbol. It is strictly a numeric code consisting of:

- 1-character UPC Type followed by 5-character UPC Manufacturing or Vendor ID Number (Graco's UPC Manufacturing ID Number is 633955)
- 5-character UPC Item Number
- 1-character Check Digit

X dimension

The intended width of the narrow elements dictated by the application and/or symbology specifications.