

# File Specifications: Barcodes

Belmark Knowledge Center | Barcodes

## Considerations for Barcodes

### Application (substrate)

Depending on the substrate, ink system and bar code art orientation, bar codes may require extra bar width reduction or “cutback”. This is done to compensate for “bar growth” due to ink gaining and spreading on certain applications.

### Symbology (type of bar code)

There are several different types of symbologies used in the marketplace. The pages within this module contain the most common used types of codes that are applied in the label and packaging industry.

### Encodation

These are the “numbers” used for the bar code. They will be encoded into the bars and spaces and there will also be “human readable” figures below the bar code.

### Magnification

It is not recommended to place UPC-A, UPC-E and EAN into designs at magnifications less than 70%. Whenever possible, a full 100% code size should be used. (See Fig. 1 for 70% Mag. UPC).

### Color

The best color choice for any bar code is a black code on a white background. This will produce a highly readable code for the scanner due to the contrast of the code against the background. Other Pantone colors can be used for bar codes, but must meet minimum reflectance values.

Considerations must also be taken for items printing on foil and transparent substrates (these will need to be backed with white ink).

### Truncation

Codes that are placed without any “truncation” or without any “cropping” to the bar code height will provide the best scan quality. Code “truncation” may be necessary within designs that have space limitations. If possible, truncation of more than 50% of the bar height should be avoided. (See Fig. 2 for bar code with truncation).

### Quiet Zone

Bar codes need a “quiet zone” or “clearance” from side-to-side to ensure the scanner does not mis-read (or not scan at all) due to other artwork that may be in close proximity to the code. In most cases, the quiet zone should be .125” or 9 times the width of the narrowest bar on either side of the code.

(See Fig. 3 for Quiet Zone).

UPC A shown at 70% magnification.



Figure 1

Truncated code. Truncated codes scan, but may have to be passed through a scanner more than one time to scan.



Figure 2

Quiet Zone is .125” minimum on each side of code, or 9 times width of narrowest bar

## BLUE CHEESE CRUMBLES

Nutrition Facts		Amount/Serving	%DV*	Amount/Serving	%DV*
<b>Total Fat</b> 00g		00g	0%	<b>Total Carb.</b> 00g	0%
Serv. Size 0 cup (00g)		<b>Sat. Fat</b> 00g	0%	<b>Fiber</b> 00g	0%
Servings 00		<b>Trans Fat</b> 00g		<b>Sugars</b> 00g	
<b>Calories</b> 00		<b>Cholest.</b> 00mg	0%	<b>Protein</b> 00g	
Fat Cal. 00		<b>Sodium</b> 000mg	0%		
*Percent Daily Values (DV) are based on a 2,000 calorie diet.		<b>Vitamin A</b> 0%		<b>Vitamin C</b> 0%	
		<b>Calcium</b> 0%		<b>Iron</b> 0%	

0 24211 32590 5

PENICILLIUM ROQUEFORTI

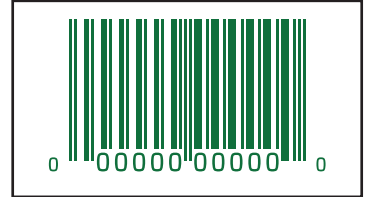
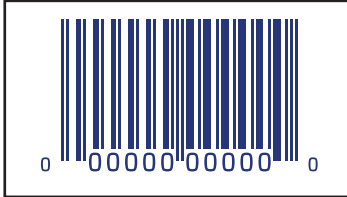
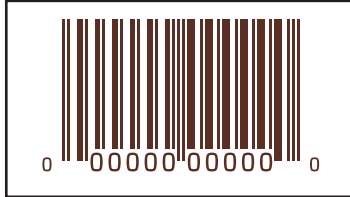
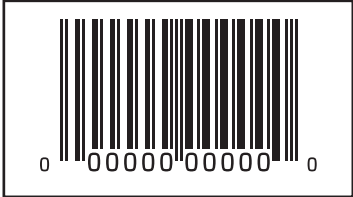
DIST. BY D-J CHEESE USA

Figure 3

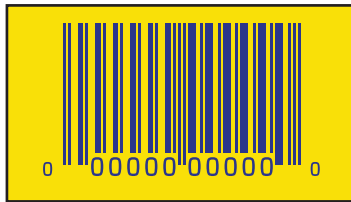
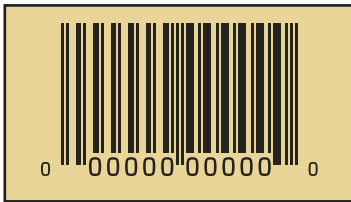
Shown below are some examples of bar code color choices and combinations that **WILL** scan.

THE IDEAL COLOR FOR A BAR CODE IS A BLACK CODE AGAINST A WHITE BACKGROUND.

Pantone colors that fall in tolerance with reflectance values can be used for bar code colors.



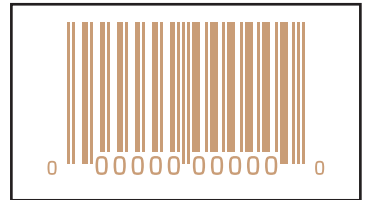
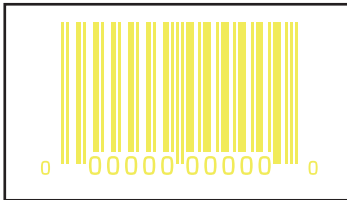
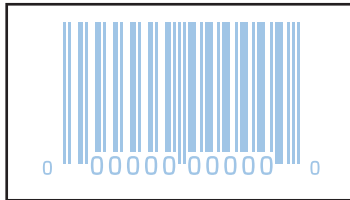
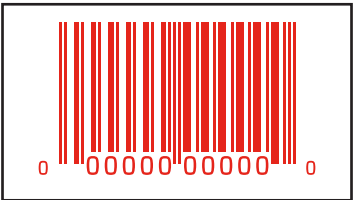
Bar codes can be printed over a colored background, provided that there is great contrast between the colors. Colors should be chosen carefully in these situations.



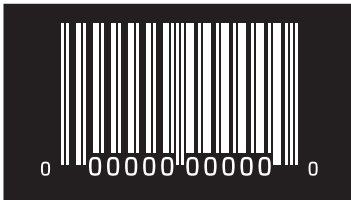
Shown below are some examples of bar code color choices and combinations that will **NOT** scan.

Avoid using red for bar codes.

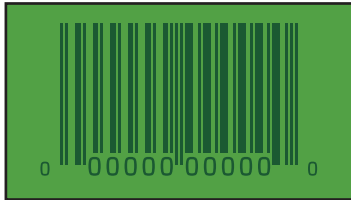
These 3 examples are poor color choices, due to lack of contrast with the background.



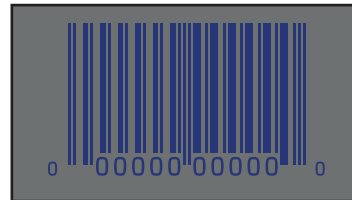
Avoid using a white or "reversed" code.



This code shown below would not scan due to lack of contrast from background color.



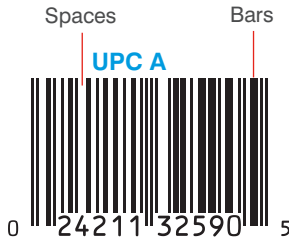
This code shown below would not scan due to lack of contrast from background color.



## MISC. INFO. / UPC / EAN

OTHER INFORMATION

### BARS AND SPACES



Shown are a UPC and a STANDARD 2 of 5. The UPC can contain information in both the width of the bars and the width of the spaces. The STANDARD 2 of 5 can only encode information in the width of the bars—all its spaces are a fixed width. Print quality is critical in either case. For example, too much impression at press or lack of contrast due to poor color choices for the bar code can result in a code that will not scan.

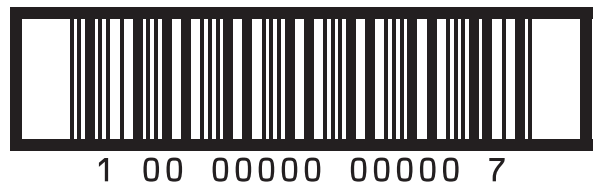


### START AND STOP PATTERNS

Each type of symbology has a distinct arrangement of bars and spaces which are used at the beginning and end of the code. These provide reading instructions, as well as scanning direction. Typically, the start pattern is at the "beginning" or left side of the code, and the stop pattern is at the end of the right side of the code.

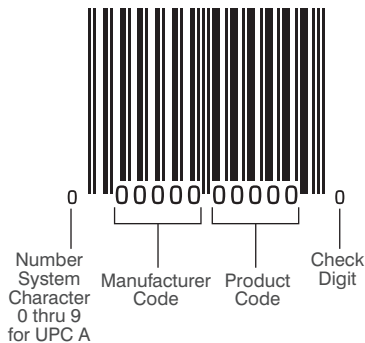
### BEARERS

Certain customers may want "bearers" surrounding a bar code. There should be an option in the bar code application to apply these. Follow supplied layouts to use in deciding the size of the bearers.



### UPC A

Most commonly used with consumer products in U.S.A.



### UPC E

Compressed version of UPC A (eliminates "extra" zeroes). Generally used on very small packaging.



The manufacturer code and product code are compressed into six characters. UPC E codes do not have an explicit check digit, rather it is encoded into the parity of the other size characters. UPC E codes may be expanded back to a UPC A.

**\*ALL VALUES PLUGGED INTO CODES ARE "MOCK" NUMBERS**

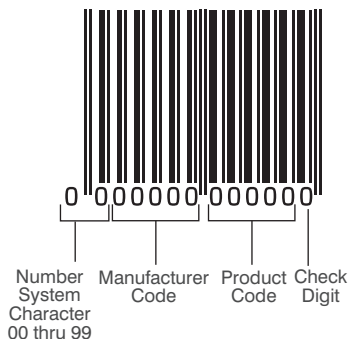
UPC and EAN codes also may include an additional supplemental code to the right of the main bar code. They are 2 or 5 digits and are typically used to encode additional information for newspapers, books or other periodicals.

Both UPC and EAN codes are bidirectional and can encode numeric information only.

UPC / EAN

### EAN-13

Based on the UPC standard, implemented in Europe. EAN codes are designed for international consumer product use.



### EAN 8

EAN 8 is an EAN equivalent of the UPC E code (compressed version). Generally used on very small packaging for international use.



EAN 8 codes are a compressed version of an EAN 13. It does carry an actual check digit. However, EAN 8 codes cannot be expanded back out to a full EAN 13.

## ISBN BOOKLAND / 2 OF 5 BAR CODES

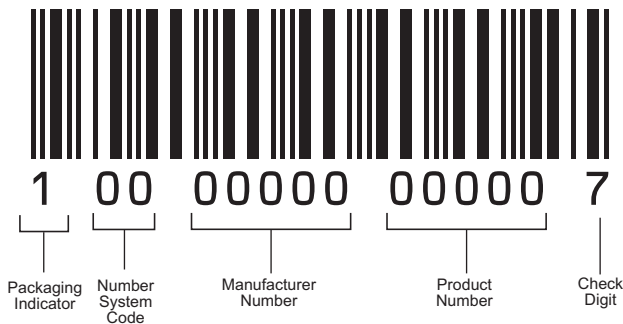
### ISBN BOOKLAND



A Bookland code is an EAN-13 code with a number system of "978" that is used exclusively for books. Bookland codes may have a supplemental code (as shown).

Interleaved 2 of 5 codes are used primarily in the warehouse industry and also in photofinishing and for airline ticketing and baggage handling. Called "2 of 5" because 2 characters are encoded in each set of 5 bars.

### INTERLEAVED-2 OF 5 SCS (1-2-5-5-1)



Shown is an INTERLEAVED 2 OF 5 code. I 2 of 5 codes are high-density codes of variable length. Most common are the (SCS) - Shipping Container Symbol used to identify contents of cartons and cases. I 2of 5 codes are numeric only and information in the the "Interleaved" version of this code is encoded in width of both the bars and spaces. STANDARD 2 OF 5 codes (see page 3) can only encode information in the width of the bars.

To avoid the possibility of a 2 of 5 code being "short read", a check digit and length check is usually used.

### I-2 OF 5 SCS (1-2-4-4-2-1)



### I-2 OF 5 SCS (1-2-4-6-1)



### I-2 OF 5 SCS (3-5-5-1)



### I-2 OF 5 SCS (5-5-5-1)



### I-2 OF 5 SCS (1-6-6-1)



**CODE 128**

**CODE 128 / COUPON CODE / UCC EAN**

**CODE 128A**



ABC0123R

Code 128A has the ability to encode the standard ASCII symbols, digits, upper case letters, and control codes.

**CODE 128B**



abc0123R

Code 128B has the ability to encode the standard ASCII symbols, digits, and upper and lower case letters.

**CODE 128C**



543210

Code 128C is a numeric only code, and compresses two numeric digits into each character, providing better code density.

**\*ALL VALUES PLUGGED INTO CODES ARE "MOCK" NUMBERS**

CODE 128 gets its name due to being able to encode all 128 characters from the ASCII character set.

Typically used in applications that require large amounts of data in a relatively small space.

**COUPON BAR CODES (UCC/EAN 128)**

**UCC/EAN 128**



5 12345 10076 0

Coupon Number System Character. Always should be a "5".

5 Digit Mfg. Code

3 Digit Mfg. "Family Code"

2 Digit "Value Code"

Check Digit

**COUPON FORMAT 1**



(8100)0 32123

Application Identifier

Num.Sys. Character/ (UCC Prefix)

5 Digit Offer Code

Coupon codes are made up of a UPC with a 128 extension. Shown are all 5 formats.

**UCC/EAN 128**



5 00000 10076 7

Coupon Number System Character. Always should be a "5".

5 Digit Mfg. Code

3 Digit Mfg. "Family Code"

2 Digit "Value Code"

Check Digit

**COUPON FORMAT 4**



(8101)0 54321 0706 (21) 12345678

Application Identifier

Num.Sys. Character/ (UCC Prefix)

5 Digit Offer Code

4 Digit Expiration Date

Application Identifier

Household ID

**UCC/EAN 128**



5 12345 10076 0

Coupon Number System Character. Always should be a "5".

5 Digit Mfg. Code

3 Digit Mfg. "Family Code"

2 Digit "Value Code"

Check Digit

**COUPON FORMAT 2**



(8101)0 32123 0706

Application Identifier

Num.Sys. Character/ (UCC Prefix)

5 Digit Offer Code

4 Digit Expiration Date

**UCC/EAN 128**



5 00000 10076 7

Coupon Number System Character. Always should be a "5".

5 Digit Mfg. Code

3 Digit Mfg. "Family Code"

2 Digit "Value Code"

Check Digit

**COUPON FORMAT 3**



(8100)0 54321 (21) 12345678

Application Identifier

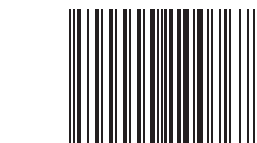
Num.Sys. Character/ (UCC Prefix)

5 Digit Offer Code

Application Identifier

Household ID

**UCC/EAN 128**



5 00000 10076 7

Coupon Number System Character. Always should be a "5".

5 Digit Mfg. Code

3 Digit Mfg. "Family Code"

2 Digit "Value Code"

Check Digit

**COUPON FORMAT 5**

(Null Code)



(8102)00

Application Identifier

Zero

Num.Sys. Character/ (UCC Prefix)

**UCC/EAN128 Serialized Shipping Container Code**

**UCC/EAN 128 SSCC-18**



(00) 1 5554612 000000254 6

Application Identifier

UCC/EAN Mfg. Number

Serial Number

Data Check Character

Packaging type

**UCC/EAN 128 SCC-14**



(01) 1 5554612 00254 6

Application Identifier

UCC/EAN Mfg. Number

Serial Number

Data Check Character

Packaging type

**UCC EAN CUSTOM**

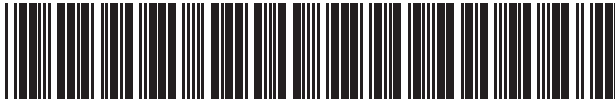


0123012301230124

## CODE 39 / CODABAR / PHARMACODE

CODE 39

### CODE 39



0123456789TEST

Code 39 is a variable length code. It is self-checking. Some applications may require an extremely high level of accuracy and may call for a check digit "modulo 43 checksum".

### \*ALL VALUES PLUGGED INTO CODES ARE "MOCK" NUMBERS

Code 39 or "3 of 9" (first alphanumeric symbology developed) is still widely used in non-retail environments.

Code 39 is the standard code used in the U.S. Dept. of Defense

CODABAR

### CODABAR



012345+ /

Codabar had a 16 character set ( 0 thru 9 and - \$ : / . + )  
Also needs to contain start/stop characters of (a,b,c,d).

CODABAR symbology is used in bloodbanks, photolabs, and Fedex airbills.

PHARMA CODE

### PHARMACODE



012345

Used in the pharmaceutical industry as a packing control system.