C800 Automation-Compatible Mail

C840 Barcoding Standards for Letters and Flats

Summary C840 describes POSTNET barcodes and defines the barcode location for letter-size and flat-size pieces. It also defines the dimensions, spacing, placement, and reflectance standards for barcodes.

1.0 GENERAL

POSTNET 1.1 POSTNET (Postal Numeric Encoding Technique) is the USPS-developed barcode method to encode ZIP Code information on mail that can be read for sorting by automated machines. A POSTNET barcode can represent a 5-digit ZIP Code (32 bars), a 9-digit ZIP+4 code (52 bars), or an 11-digit delivery point code (62 bars). The information content of the barcode is based on the combination of tall (full) bars and short (half) bars. A tall bar represents "1," and a short bar represents "0." When separated into groups of five, these bars sequentially represent each of the digits of the ZIP Code (or ZIP+4 code or delivery point code) for the delivery address, plus an additional digit designated as the *correction digit.* The correction digit is derived from adding the numbers in the ZIP Code (or ZIP+4 or delivery point code) and determining which single-digit number must be added to that sum to make the total a multiple of 10. The first and last bars of the barcode are *frame bars* and must always be full bars.

5-Digit Barcode 1.2 A 5-digit barcode is a single field of 32 bars consisting of a frame bar, a series of 25 bars that represent the correct 5-digit ZIP Code for the address on the piece, 5 bars that represent the correction digit, and a final frame bar.

ZIP+4 Barcode 1.3 A ZIP+4 barcode is a single field of 52 bars consisting of a frame bar, a series of 45 bars that represent the correct ZIP+4 code for the address on the piece, 5 bars that represent the correction digit, and a final frame bar.

Delivery Point Barcode 1.4 A delivery point barcode (DPBC) is formed by adding 10 bars (representing two additional digits) to the ZIP+4 barcode. The correct DPBC must be derived from a CASS-certified delivery point code address matching process. To obtain information on the rules for delivery point code calculation, contact the National Customer Support Center by calling (toll-free) 1-800-642-2914, or by writing to CASS/ZIP+4 Matching, National Customer Support Center (see G043 for address). The following unique codes are also valid DPBCs:

a. For a firm (unique) 5-digit ZIP Code, the correct DPBC represents the 5-digit ZIP Code: either the USPS-assigned -0001 or (if the customer assigns four-digit add-ons to internal separations) the correct four digits applicable to the point of delivery, followed by the last two digits of the primary street number, post office box number, or rural/highway contract route box number derived from the standardized address returned by the CASS-certified ZIP+4 or delivery point code address matching process.

b. For an individual (unique) ZIP+4 code assigned to a business customer, the correct DPBC represents the ZIP+4 code followed by the last two digits of the primary street number derived from the standardized address returned by the CASS-certified ZIP+4 or delivery point address matching process.

2.0 BARCODE LOCATION FOR LETTER-SIZE PIECE

Barcode Clear Zone
2.1 Each letter-size piece in an automation rate mailing or claimed at an Enhanced Carrier Route saturation or high density rate must have a barcode clear zone unless the piece bears a DPBC in the address block. The barcode clear zone and all printing and material in the clear zone must meet the reflectance standards in 5.0. The barcode clear zone is a rectangular area in the lower right corner of the address side of cards and letter-size pieces defined by these boundaries:

a. Left: 4-3/4 inches from the right edge of the piece.

b. Right: right edge of the piece.

c. Top: 5/8 inch from the bottom edge of the piece.

d. Bottom: bottom edge of the piece.

General Standards
2.2 Automation rate pieces and pieces claimed at an Enhanced Carrier Route saturation or high density rate that weigh 3 ounces or less may bear a DPBC either in the address block or in the barcode clear zone. Pieces that weigh more than 3 ounces must bear a DPBC in the address block.

Barcode on Mailpiece
2.3 Except as noted in 8.2 for 5-digit barcodes, if the barcode is printed directly on the mailpiece in the lower right corner, the entire barcode must be within the barcode read area defined by these limits:

a. Horizontally, the leftmost bar must be between 3-1/2 inches and 4-1/4 inches from the right edge of the piece.

b. Vertically, the barcode must be within the area between 3/16 inch and 7/16 inch from the bottom edge of the piece; the bottom of the bars must be 1/4 inch ±1/16 inch from the bottom edge of the piece.

Barcode on Insert
2.4 If the barcode is printed on an insert to appear through a window in the lower right corner of an envelope:

a. The envelope and window must meet the physical standards in 7.0.

b. The entire barcode must be within the barcode clear zone (but need not be completely within the barcode read area).

c. When the insert showing through the window is moved to any of its limits inside the envelope, the entire barcode must remain within the barcode clear zone, and a clear space must be maintained that is at least 1/8 inch between the barcode and the left and right edges of the window, at least 1/25 inch between the barcode and the top edge of the window, and at least 3/16 inch between the barcode and the bottom edge of the mailpiece.

Barcode in Address Block
2.5 When the barcode is included as part of the address block:

a. The barcode must be placed in one of these positions:

(1) Above the address line containing the recipient's name.
(2) Below the city, state, and ZIP Code line.
(3) Above or below the keyline information.
(4) Above or below the optional endorsement line.

b. The printing of the barcode is prohibited anywhere between the address line containing the recipient's name and the city, state, and ZIP Code line.

c. The minimum clearance between the barcode and any information line above or below it within the address block must be at least 1/25 inch, and the separation between the barcode and top line or bottom line of the address block must not exceed 5/8 inch. The clearance between the leftmost and rightmost bars and any adjacent printing must be at least 1/8 inch.

d. If a window envelope is used, the clearance between the leftmost and rightmost bars and any printing or window edge must be at least 1/8 inch, and the clearance between the barcode and the top and bottom window edges must be at least 1/25 inch. These clearances must be maintained during the insert's range of movement in the envelope. Address block windows on heavy letter mail (as defined in 2.2) *must* be covered; such windows *may* be covered on other mail. Covers for address block windows are subject to 7.3.

e. If an address label is used, a clear space of at least 1/8 inch must be left between the barcode and the left and right edges of the address label, and the clearance between the barcode and the top and bottom edges of the address label must be at least 1/25 inch.

f. The rightmost bar must be at least 1/2 inch from the right edge of the mailpiece, and the leftmost bar must be less than 10-1/2 inches from the right edge of the mailpiece and at least 1/2 inch from the left edge of the mailpiece; the top of each bar must be less than 4 inches from the bottom edge of the mailpiece; and the bottom line of the address block, including the barcode, must be at least 5/8 inch from the bottom of the mailpiece.

3.0 BARCODE APPLICATION—FLAT-SIZE PIECE

General Requirements
3.1 On any flat-size piece claimed at automation rates, the piece may bear one POSTNET barcode under 3.2 or may bear two POSTNET barcodes under 3.3. Other mailer-applied non-POSTNET barcodes may appear on the address side of the piece if the barcode format is not detectable or confusing to automated postal equipment.

Applying One POSTNET Barcode
3.2 On any flat-size mailpiece claimed at an automation rate, the barcode may be anywhere on the address side as long as it is at least 1/8 inch from any edge of the piece. For FSM 1000 mailpieces, the preferred location of the barcode is at least 2 inches from the edge of the dimension that is the length for that type of automation piece (the longest edge or, for pieces with a folded or bound edge, the folded or bound edge). The portion of the surface of the piece on which the barcode is printed must meet the barcode dimensions and spacing requirements in 4.0 and the reflectance standards in 5.0. Address block barcodes are subject to the standards in 2.5a through 2.5e.

Applying a Second POSTNET Barcode
3.3 At the mailer's option, a second POSTNET barcode may be applied to the piece only if the first POSTNET barcode on the piece is an address block barcode prepared under 3.2 that is not CASS-certified. In addition, the second barcode must meet the following requirements:

a. It must be must be a delivery point barcode (DPBC).

b. The preferred placement is the lower right corner of the mailpiece parallel to and in the same direction as the delivery address.

c. It must be placed at least 1 inch below the return address.

d. The space between the two POSTNET barcodes must be greater than 1 inch.

4.0 BARCODE DIMENSIONS AND SPACING

Barcodes are subject to these standards for bar dimensions and spacing. Extraneous ink or ink voids must not cause any bar to fail to meet these standards:

a. A full bar must be 0.125 ±0.010 inch high.

b. A half bar must be 0.050 ±0.010 inch high.

c. All bars must be 0.020 ±0.005 inch wide.

d. Measured over any 1/2 inch, horizontal spacing of the bars must be 22 ±2 bars per inch, and pitch (a bar and a space) must average at least 0.0416 inch but no more than 0.05 inch. The clear vertical space between bars must not be less than 0.012 inch or more than 0.04 inch.

5.0 REFLECTANCE

Background Reflectance
5.1

A background reflectance of at least 50% in the red portion and 45% in the green portion of the optical spectrum must be produced in the following locations when measured with a USPS or USPS-licensed envelope reflectance meter:

a. The barcode clear zone of a card-size or a letter-size piece barcoded in the lower right corner.

b. The area surrounding the barcode (within 1/8 inch of the leftmost and rightmost bars and 1/25 inch above and below the barcode) of a card-size, letter-size, or flat-size piece barcoded in the address block and of a flat-size piece barcoded elsewhere.

Print Reflectance Difference
5.2

A print reflectance difference (PRD) of at least 30% in the red and green portions of the optical spectrum is required between the background material of the mailpiece and the barcode, when measured with a USPS or USPS-licensed envelope reflectance meter. (PRD equals the reflectance of the background minus the reflectance of the ink.)

Opacity
5.3

The material on which the barcode appears must have enough opacity to prevent printing from “showing through” to the extent that it interferes with postal equipment that reads the barcode. The PCR of print (other than the barcode) that shows through the barcode clear zone or the barcode area in the address block must not exceed 15% when measured in the red and green portions of the optical spectrum.

Dark Fibers and Background Patterns
5.4

Dark fibers or background patterns (e.g., checks) that produce a print contrast ratio of more than 15% when measured in the red and green portions of the optical spectrum are prohibited in these locations:

a. The area of the address block or the barcode clear zone where the barcode appears on a card-size or a letter-size piece mailed at automation rates or at Enhanced Carrier Route saturation or high density rates.

b. The area of the address block or the area of the mailpiece where the barcode appears on a flat-size piece in an automation rate mailing.

6.0 SKEW AND BASELINE SHIFT

Card-Size and Letter-Size Pieces
6.1

For a barcode on a card-size or a letter-size piece, the combined effects of positional skew (slant or tilt of the entire barcode baseline) and rotational skew (slant or tilt of the individual barcode bars) must be limited to a maximum rotation of the bars of ±5 degrees from a perpendicular to the bottom edge of the piece.

The individual bars of a barcode must not shift (be vertically offset) more than 0.015 inch from the average baseline of the barcode.

Flat-Size Piece
6.2 For a barcode on a flat-size piece, the maximum rotational skew (slant or tilt of the individual barcode bars) is ±10 degrees from a perpendicular to the baseline of the barcode; there is no positional skew requirement. The individual bars of a barcode must not shift (be vertically offset) more than 0.015 inch from the average baseline of the barcode.

7.0 LOWER RIGHT CORNER BARCODE WINDOW FOR LETTER-SIZE MAIL

Edges of Barcode Window
7.1 The edges of the barcode window must meet these criteria:

a. Left: at least 4-3/4 inches from the right edge of the envelope.

b. Right: at least 1/4 inch from the right edge of the envelope.

c. Top: at least 5/8 inch from the bottom of the envelope.

d. Bottom: form part of the bottom edge of the envelope.

Window Construction
7.2 A barcode window must extend fully to the bottom edge of the envelope, must be of wraparound construction, and must be covered subject to 7.3.

Window Cover
7.3 The window cover must be of a nontinted clear or transparent material (e.g., cellophane or polystyrene) that permits the barcode and its background, as viewed through the window material, to meet the reflectance standards in 5.0. The edges of the window cover must be securely glued to the envelope.

8.0 5-DIGIT AND ZIP+4 BARCODES

Permissibility
8.1 An automation rate letter-size piece may not bear a 5-digit or ZIP+4 barcode in the lower right corner (barcode clear zone); the piece may bear a 5-digit or ZIP+4 barcode in the address block only if a DPBC appears in the lower right corner. A Qualified Business Reply Mail piece and other barcoded letter-size Business Reply Mail must bear only a ZIP+4 barcode. The ZIP+4 barcode may appear in the address block when printed on an insert that appears through a window or on an address label affixed directly to the piece; or it may appear in the lower right corner either printed directly on the mailpiece or on an insert that appears through a window. An automation rate flat-size piece must not bear a 5-digit barcode.

Leftmost Bar
8.2 Any 5-digit barcode must be located as specified in 2.0, except that, if placed in the barcode clear zone, the leftmost bar of the barcode must be between 4-1/8 and 4-1/4 inches from the right edge of the mailpiece.

9.0 DPBC NUMERIC EQUIVALENT

In delivery point barcoded automation rate mailings only, the numbers corresponding to the POSTNET bars in a correct delivery point barcode (DPBC) may appear in the delivery address. If read from left to right, a correct DPBC numeric equivalent consists of five digits, a hyphen, and seven digits.

10.0 BARCODE SOFTWARE AND HARDWARE CERTIFICATION

Purpose
10.1 To help mailers evaluate the quality of their equipment producing barcodes, the USPS offers optional testing and certification to manufacturers of barcoding software and hardware. Certified barcoding equipment ensures that the equipment can produce dimensionally correct barcodes meeting postal specifications. Certification does not ensure that barcodes produced from that equipment can

meet the requirements for automation rates because many other variables in barcode production (e.g., ink color and quality, paper color and contrast, equipment operation and maintenance) affect the quality of the barcodes printed on mailpieces.

Testing Arrangements
10.2 Manufacturers who want their products tested and mailers who want information on available certified products should contact the National Customer Support Center (see G043 for address).